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Manpower Critical Indicators Study: Final Report

Aline O. Quester • Anthony M. Jareb
William B. Lambert, Maj, USMC
Gary Lee, SgtMaj, USMC (Ret.)
Theresa H. Kimble

4825 Mark Center Drive • Alexandria, Virginia 22311-1850

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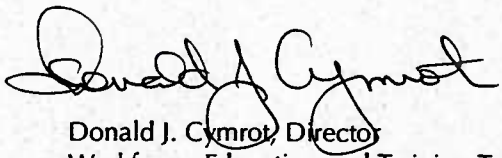

Donald J. Cymrot, Director
Workforce, Education and Training Team
Resource Analysis Division

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Abstract

This study developed five overarching indicators to assess the current status of the numerous manpower processes, as well as to point to possible difficulties in the future. The first two indicators address Marine Corps manpower requirements in terms of strength and the number of fully trained Marines. The third focuses on new Marines, comparing onboard Marines in their initial MOS training with Marine Corps requirements for these occupations. To make this third indicator effective, however, the Marine Corps will need to better align GAR requirements for training MOSs (generally the XX00 MOSs) with the assignment of these MOSs to new Marines.

The fourth overarching indicator is the aviation officer inventory and its projection into the future. The Marine Corps has had no way to forecast aviation officer inventory and, thus, no way to foresee possible problems. Because of the long aviation training pipeline, it will take much longer to fix any aviation officer shortfalls than to fix problems in other communities; we regarded the lack of the ability to forecast aviation officer inventories as a serious shortfall. We identified a new data field necessary for aviator inventory projections that will be operational in manpower data systems by April 2003. We also developed an inventory projection model that will use this information to forecast future inventories.

Our last overarching indicator is a list of planned and actual completion dates for critical inputs: Trooplist, ASR, GAR, Accession Plan (Memo 01), and so on. Delays in these inputs cause the manpower process to stall; raising the visibility of the inputs should help ensure their timely completion. Finally, the study developed a series of critical indicators for the subprocesses of recruiting retention, attrition, and initial skill training. We also included two recommendations: (1) Change the definition of short/over MOSs to include both numbers under/over and percentage fill and (2) devote serious attention to fixing delays in the posting of accessions into the manpower system.

Executive summary

Background

The mission of the Deputy Commandant for Manpower and Reserve Affairs (DC M&RA) is to provide the appropriate number of adequately trained, sufficiently experienced, qualified Marines to unit commanders so that they can accomplish their assigned missions. Because the Marine Corps devotes about 65 percent of its budget to personnel costs, any improvement in the manpower process provides the opportunity to realize significant monetary savings while improving unit manning and readiness. Accurate and meaningful measures of effectiveness are needed to ensure the efficient and effective running of the manpower process and to identify possible problems.

The Human Resources Development Process (HRDP) runs across a number of agencies that make up the manpower system. Each functionally based agency has different and often competing goals and measures of effectiveness. Cross-functional integration teams attempt to bridge the stovepiped nature of the different agencies. Performance indicators actively managed by these cross-functional integration teams and overseen by senior decision-makers are critical to proper and efficient management of the manpower process.

Against this backdrop, the study task was to identify the most accurate predictors of the relative health of the manpower process and to evaluate and validate indicators both within the compartmentalized processes in the HRDP and in the Marine Corps as a whole. In addition, the study team was to develop easily accessible and understandable methods to display these indicators for Marine Corps senior leaders and decision-makers.

Methodology and major findings

The study team began by interviewing decision-makers, from general officers to action officers, involved with the manpower process to determine what indicators are currently used and where officers believe there are information gaps. One early finding was that there was a paucity of indicators for most processes, with recruiting the most important exception. The final indicators emerged slowly, after much discussion with the many officers who have assisted the team in this study.

This study developed five overarching indicators for assessing the status of numerous manpower processes and for identifying possible future difficulties. The first two indicators address Marine Corps manpower requirements in terms of strength and the number of fully trained Marines—two numbers that do not always follow the same pattern. In fact, enlisted strength peaks in the fall at exactly the point where the number of trained Marines is at its lowest point. By establishing benchmark patterns for these two series, we believe the Marine Corps will better evaluate their current information.

The third overarching indicator focuses on new Marines, comparing onboard Marines in their initial MOS training with Marine Corps requirements for these occupations. To make this third indicator effective, however, the Marine Corps will need to better align training MOS (generally the "XX00" MOSs) GAR requirements with new Marines' corresponding fleet MOS assignments. Both this indicator and an earlier one compare onboard strength to requirements (by PMOS for the fully trained Marines and by training MOSs for those in training). The Marine Corps has not regularly used aggregate indicators that measure strength against MOS requirements; we believe this has been an unfortunate reporting shortfall, which we hope these new indicators will rectify.

The fourth overarching indicator is the aviator inventory and its projection into the future. The Marine Corps has had no way to forecast aviator inventories and, thus, no way to foresee possible problems. Because of the long aviation training pipeline, it will take much longer to fix aviator shortfalls than to fix other Marine Corps

communities' shortfalls. We regarded this forecasting incapability as a serious deficiency. After identifying a new data field necessary for aviator inventory projections and obtaining DC M&RA's approval for its addition, the Marine Corps instituted the new field, which will be operational in manpower data systems by April 2003. Our inventory projection model will use this information to forecast aviator inventories.

Our last overarching indicator is a list of planned and actual completion dates for critical inputs, including Trooplist, ASR, GAR, and Accession Plan (Memo 01). Delays in these inputs stall the manpower process; raising these inputs' visibility should help ensure their timely completion and smoother manpower processes' functioning.

The study also developed a series of critical indicators of various subprocesses: recruiting, retention, attrition, and initial skill training. The entirely new initial skill training critical indicators probably merit the most discussion because they will fill action officers' and their leaders' serious incapability to monitor the "street-to-fleet" process.

Using a new data field, PMOS attainment date, and various algorithms, the study team has built a database from the total force data warehouse (TFDW) that calculates all new Marines' time to train (accession date to PMOS attainment date). Because some schools graduate students only during a few months of the year, we calculate the time to train as a moving average of the last 12 months. Thus, for May 2002, the time to train (by PMOS or by some aggegation—all officers, all enlisted, etc.) is the average time for all new personnel who obtained their PMOS in the June 2001 through May 2002 period. The database also calculates time awaiting training for all those who completed training. This calculation is the difference between planned training time, obtained from the Training and Education Command, and the actual training time.

Thus, the Marine Corps will now be able to calculate each month both the time to train and the time awaiting training at whatever aggregation is appropriate. This entirely new manpower process indicator should be an important tool for those who hope to improve the manpower process's efficiency.

Courses of action and recommendations

In addition to the recommended manpower data system field addition we already discussed, the study team included two recommendations in the final report. First we recommended changing the definition of short/over MOSs. The Marine Corps defines short MOSs as those with less than 90 percent of the GAR, balanced MOSs as those with 90 to 110 percent of the GAR, and over MOSs as those with more than 110 percent of the GAR. We believe that MOS short/balanced/over definitions should reflect both percentage fill and the number of Marines that are over or under. In particular, we would suggest a definition, such as:

- Short (less than 90 percent *or* 100 short) or
  - — Short (less than 90 percent and at least 10 short *or* 100 short)
- Over (more than 110 percent *or* 100 over) or
  - — Over (more than 110 percent and at least 10 over *or* 100 over).

For example, 0311s were "balanced" last spring at over 90 percent strength, but they were more than 1,000 under the GAR. That means that 1,000 structure spaces were unfilled. In contrast, some very small MOSs (e.g., MOSs 2674 and 1181) were "short" at less than 90 percent strength, but were only 1 or 2 Marines under the GAR. By not flagging 0311s as short in spring 2001, we believe we missed an early-warning sign of trouble in the infantry MOS.[1]

Our second recommendation is that the Marine Corps devote serious attention to reducing accession posting delays in the manpower system. The endstrength planner must rely on MCRC reports regarding the number of recruits shipped each month. When some September accessions are not posted into the system until October, endstrength projections are wrong and the Marine Corps could miss its congressionally set endstrength target.

1. The 0311s were short in fall 2001 (by almost 1,500 Marines).

Contents

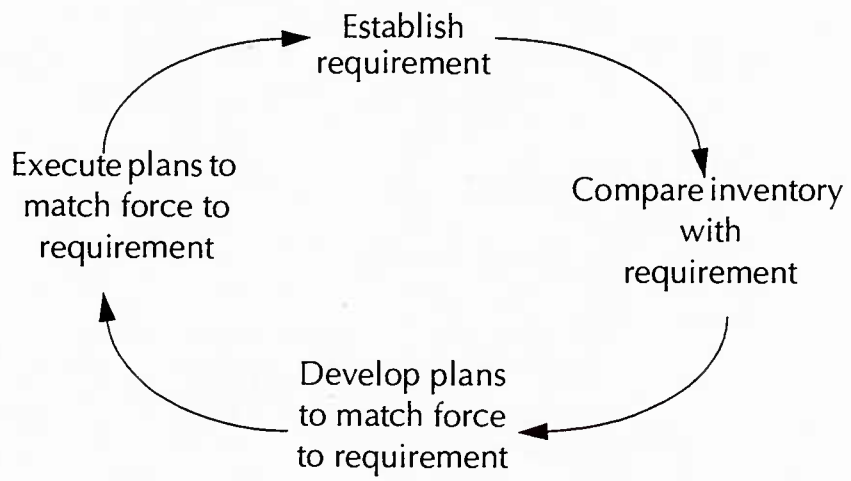
Introduction

The overall manpower process is both cyclic and dynamic, with continuous flows of new and existing Marines into and out of the force. Of all the services, the Marine Corps has the largest relative inflows and outflows. Even though it is considerably smaller than the Air Force, the accession requirements of the Corps approximate those of the Air Force because of Marine Corps requirements for a young and vigorous first-term force.

Manpower requirements can vary with changes in the Marine Corps' national security role, the evolution of capabilities, or the periodic implementation of newer equipment. These changes are incorporated in manpower plans as well.

The manpower process identifies manpower requirements and develops a personnel inventory to match those requirements. Figure 1 depicts a simplified form of this cyclic process. In fact, some processes overlap because execution is continuous, whereas planning is periodic and looks to the future.

Figure 1. Simplified view of steps in manpower process



Purpose of the study

The Marine Corps manpower process works well. Indeed, the Marine Corps was the only service during the late 1990s that consistently met its recruiting goals without reducing enlistment standards, and consistently met endstrength goals without experiencing substantial retention problems. Even with these successes, the Marine Corps continually strives to improve the manpower process.

The purpose of this study is to identify better measures, or critical performance indicators, of the overall manpower process. We believe that the complexity of the process and the varied commands, departments, and action officers invariably encourage some suboptimal decisions and prevent early problem recognition. Developing a timely set of indicators for decision-makers that reflect the state of the manpower process's various components can improve overall effectiveness and personnel readiness.

The intent of this study is to:

- Provide early warning or indications of future trouble in particular manpower process areas.
- Provide information for action officers who work on processes that cross divisions or sections (i.e., to make the processes less stovepiped).
- Provide senior leaders with more regular information on the overall manpower system.
- Provide information about the manpower process's overall health or status that will increase manpower system awareness.

Organization of the report

We have divided the remainder of this report into several sections. The first section presents an overview of the overarching indicators that we propose, as well as critical indicators for processes and subprocesses. Some of the indicators are straightforward and need no further explanation than that provided in the overview. Others, however, involve more original research or explanation. Thus, we include

additional sections that discuss in more detail indicators for meeting requirements, Marines in training, and the aviator inventory. We conclude with a short section on additional recommendations that resulted from the study.

Finally, the report contains three appendices:

- Appendix A provides more information on the comparisons between GAR requirements and personnel inventory.
- Appendix B provides a detailed review of the subprocesses for making and retaining Marines. It begins with a discussion of manning and how requirements are developed, and proceeds to a discussion of recruiting and entry-level training. The latter involves numerous subprocesses, which are all detailed in the appendix. Finally, there is a discussion of the inventory development process after the first term of service, specifically the FTAP and STAP.
- Appendix C provides a sample critical indicators briefing.

Critical indicators for Marine Corps manpower

Overarching indicators

In this section, we provide an overview of the indicators that we believe should be regularly monitored. We start with overarching indicators reflecting strength and requirements. These indicators are the outputs of numerous processes: recruiting, training, attrition, and retention—to name but a few. They are:

- Marine Corps strength versus the number of fully trained Marines
- Meeting requirements: overall numbers of trained Marines by grade and MOS
- Meeting requirements: Marines in training.

Other overarching indicators are as follows:

- Time to train and time awaiting training
- Aviator inventory
- Critical inputs: Planned and actual completion dates.

After this discussion of overarching indicators, we move down to indicators for recruiting, retention, and attrition.

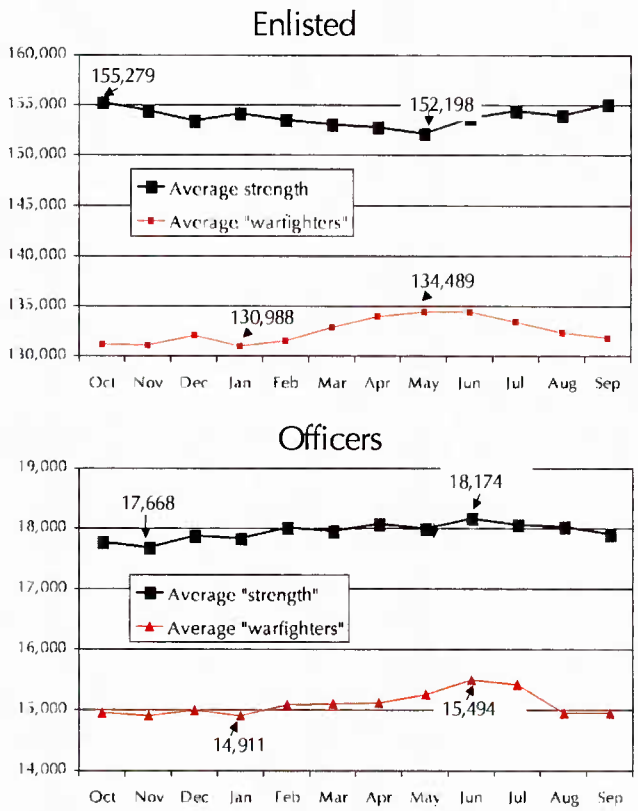
Marine Corps strength versus the number of fully trained Marines

People speaking about Navy structure refer to ships or planes or submarines—the platforms. People speaking about Marine Corps structure refer to battalions or squadrons—the Marines. Thus, our first indicator is a comparison of the number of Marines on board (strength) and the number of fully trained Marines (warfighters).

The number of fully trained enlisted Marines does not parallel the pattern for enlisted strength because of enlisted accessions' sharp

seasonality. Figure 2 uses averages for the last 3 years to illustrate this point. In fact, the peak of enlisted strength that usually occurs in October represents the low point for the number of fully trained Marines (the warfighters). This important fact is not well understood within the Marine Corps. A better understanding of the seasonality in the number of warfighters should make commanders less discontent with their units' onboard strength in the fall when the number of warfighters is always below average. Thus, we propose getting this indicator out to the commanders of the operational forces and the supporting establishment, as well as to the advocates. The major subordinate commands' G-1s could routinely advise their commanders *on the expected highs and lows* of available warfighters throughout the year. We would suggest superimposing current-year numbers for strength and warfighters on the figure below.

Figure 2. Marine Corps strength and numbers of fully trained Marines (warfighters)



This indicator compares historical averages for strength and fully trained Marines. Any big differences between the current year and the historical averages for the number of warfighters that are not explained by differences in current-year strength or circumstances would warrant further explanation. For example, proportionally more (less) warfighters than average would indicate an increasingly (decreasingly) efficient entry-level training process.[1]

Meeting requirements: overall numbers of trained Marines by grade and military occupational specialty (MOS)

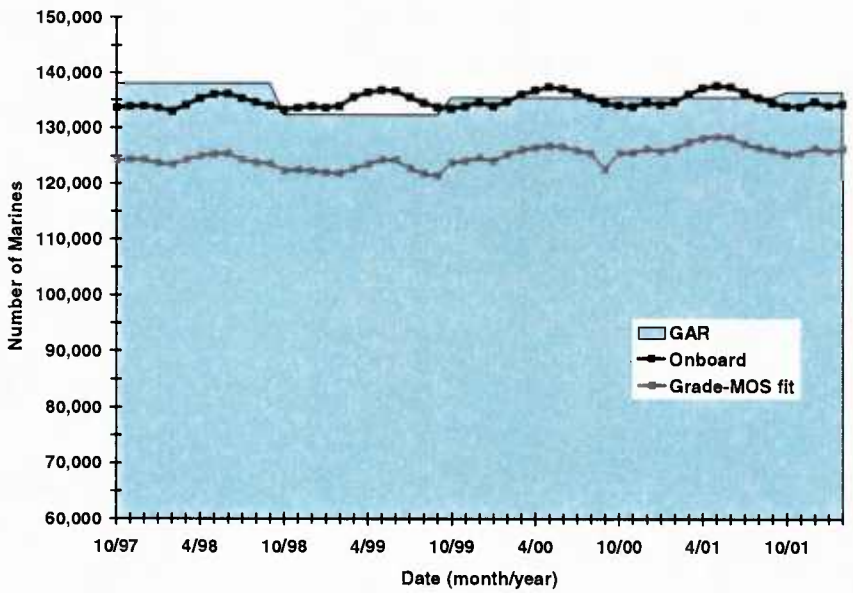
Marine Corps planners plan to the grade-adjusted recapitulation (GAR) requirements that specify numbers by grade and MOS. However, the Marine Corps has never systematically measured how well the onboard inventory reflects the GAR requirements. We think this is a mistake. Although requirements change faster than onboard inventory can change, it is still important for the Marine Corps to track how well the onboard inventory compares with current requirements. We propose that the Marine Corps regularly compare GAR requirements with the inventory of onboard Marines and suggest two comparisons:

- Overall numbers (the fill)
- The number of GAR requirements filled by primary MOS (PMOS) and grade (the fit). To compute the fit, for each PMOS/grade combination, we exclude Marines in that PMOS-grade cell who are in excess of the requirement.

1. This indicator should not be confused with endstrength forecasting or planning. Developing an endstrength plan and then monitoring endstrength throughout the year is a complicated process that uses many inputs besides historical patterns. Monitoring endstrength to ensure that congressionally set endstrength levels are met involves different inputs and has a different goal than the indicator we describe here. It is critical to the Marine Corps that it meet endstrength, but this criticality is primarily a Congress/budget-centered requirement. *In contrast, our indicator for warfighters is a critical indicator for the operating forces, as well as manpower planners and managers.*

Figure 3 shows this comparison for enlisted Marines in all nontraining MOSs (warfighters). The GAR is the shaded area, the darker line is the number of onboard Marines in nontraining MOSs, and the grey line is the number of Marines filling grade/MOS requirements. The grey line is below the black line because some MOS/grade combinations have Marines in excess of requirements. Figure 3 shows that the overall numbers of enlisted Marines approach the GAR requirement, *but about 10,000 of them are in excess of the grade requirement for their MOS.*[2] In other words, 10,000 GAR requirement billets for enlisted trained warfighters are *not* being filled.

Figure 3. E1-E9 nontraining MOSs: GAR vs. onboard vs. grade-MOS fit

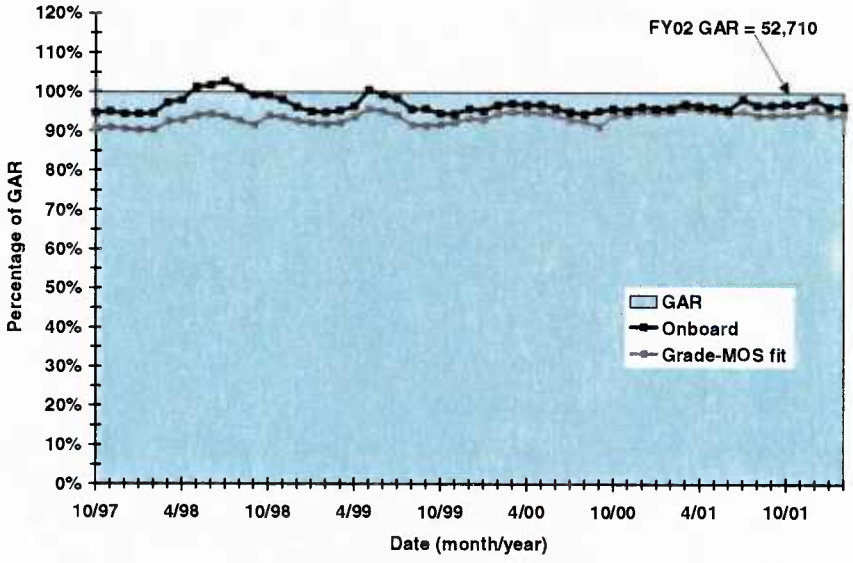


We make this comparison for other MOS and grade groupings. Figure 4 shows this comparison for corporals and sergeants in nontraining MOSs. The comparison indicates a persistent shortfall in meeting the overall GAR requirement *but an improving fit.* In short,

2. We grouped E1-E3, E4-E5, and E6-E9 together so that the grade fit is in one of these three categories. For example, if the GAR requirement for E4-E5s in a particular MOS is 120 and there are 130 such Marines, we only count 120 for the grade/MOS fit.

the MOS inventory for E4/E5 Marines more closely matches the requirements now than it did in the past.

Figure 4. E4-E5 nontraining MOSs: onboard and grade-MOS fit as percentage of GAR

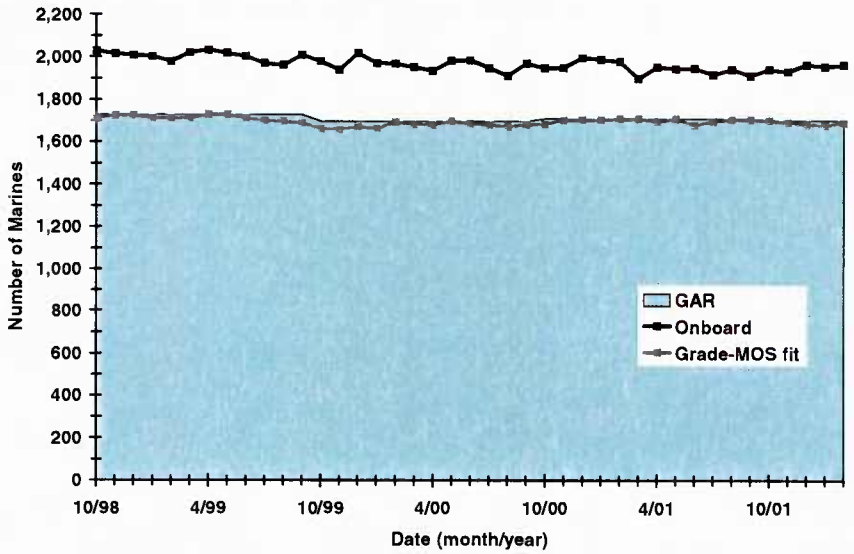


The overall GAR requirements for officers and enlisted personnel are the congressionally mandated endstrengths. Overall, the GAR will equal onboard strength, at least on 30 September of each year. Within officer or enlisted personnel categories, however, requirements may not match onboard inventories. If onboard strength exceeds requirements, the fit will probably be quite close to requirements. In short, there are more than enough Marines to fill most MOS requirements. Although the particular set of requirements for this category of officers or enlisted personnel is met, some other set of requirements is *not* being met. Overall, the GAR equals strength; thus, if Marines are in *excess* of requirements in one area, they are in *deficit* in another.

Figure 5 presents a similar comparison for O1-O3 combat arms officers. This figure illustrates the last point above: *If strength significantly exceeds requirements, the grade/MOS fit is likely to satisfy the GAR requirements.* Consider a GAR requirement of 25 for each of four MOSs (overall GAR requirement of 100). If the strength in these MOSs is 30, 35, 28, and 26, the GAR requirement of 25 in each MOS will be

met. In brief, when strength significantly exceeds requirements, our measure of fit will be good for the area being examined. The 300 or so excess combat arms O1 to O3s, however, will show up as a 300 deficit someplace else because overall GAR requirements equal overall strength.

Figure 5. O1-O3 combat arms: GAR vs. onboard vs. grade-MOS fit



Meeting requirements: Marines in training

The Marine Corps has the youngest force of all the services, with about 110,000 of the 155,000 enlisted Marines in their first term of service. Channeling new Marines into appropriate MOSs is critical if the Marine Corps is to meet MOS readiness requirements. Even though many dedicated action officers and analysts devote considerable resources and talent to this process, there are still inefficiencies because the process spans a fairly long time period[3] and involves many different commands.

3. Training and Education Command as well as Enlisted Plans in the MP division finish their plans as much as 2 years before the last accession for that fiscal year cohort begins his or her initial MOS training.

The Marine Corps lacks an overall indicator that measures the process output—namely, how well the Marine Corps channels Marines into MOS requirements. We believe this overall indicator deficiency is a serious problem. *The first-term force will not have the correct MOS mix unless first-term Marines are channeled into the correct MOSs.* Furthermore, 4 years later, the reenlistment pool will lack the correct MOS mix. In short, incorrectly channeling first-term Marines creates problems for both the present and the future.[4]

Thus, we propose comparing GAR entry-level training requirements with Marines in entry-level training. Let's first look at some notional (fictional) data for 0300, infantry training, comparing the GAR requirements by MOS for E1-E3 Marines in this training MOS[5] with the onboard Marines in this training MOS (figure 6).[6]

Figure 6 shows the familiar seasonal pattern, with the big increase in infantry training each fall as the summer recruits complete boot camp and begin MOS training. In the figure, the onboard counts above the GAR requirement are roughly equal to the counts below the GAR. Thus, the notional data in the figure indicate that the numbers being trained in infantry MOSs roughly reflect the GAR requirement for infantry training. If, however, one imagines a redrawn GAR requirement line horizontal at its highest level, the training onboard numbers would be considerably below the GAR requirement, indicating a need to put more recruits into infantry training.

Why did we use notional data for figure 6? We have onboard inventory counts and GAR requirements for all entry-level training. For enlisted personnel, this consists of:

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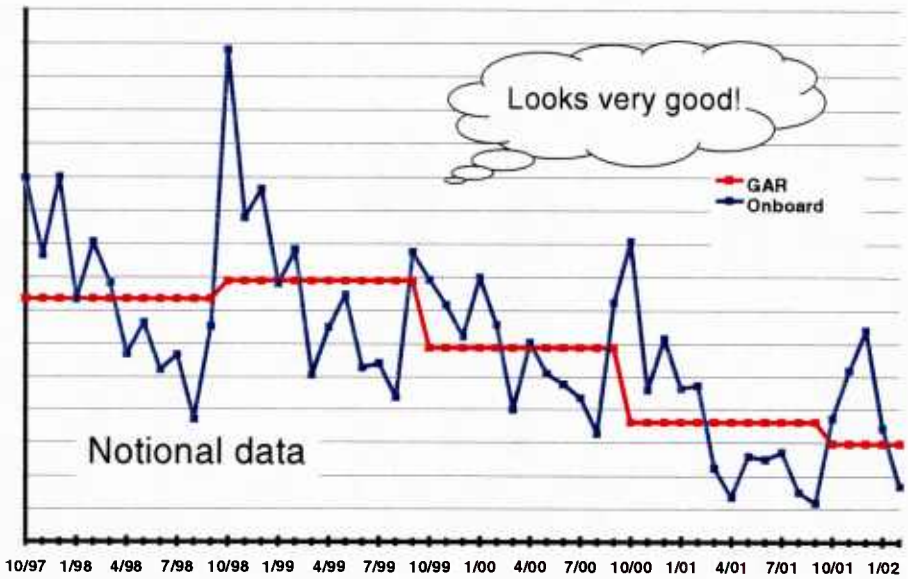
4. We understand that requirements change, and the current force will not reflect these changes. This cannot be helped because technology and military missions change.

5. *Training MOSs* is a nonstandard term. These are MOSs that Marines hold during initial MOS training that qualifies them for a billet assignment (e.g., 0100, 0200, 0300).

6. We focused on enlisted, but the same reasoning works for officers. For example, for infantry officers, we would compare the GAR requirement for 0301 (Basic Infantry Officer) with the onboard numbers for MOS 0301.

- Recruit training MOSs (9971 and 9900)
- MOS training (0100, 0200, 0300, etc.).

Figure 6. Infantry training (0300): GAR requirement and onboard



Why don't we use actual data? The problem is that the actual data provide an "apples and oranges" comparison. Briefly, the process that determines training MOS GAR requirements and the process that assigns training MOSs are not aligned. The GAR reflects only Marine Corps Recruit Depot (MCRD) training, but new Marines retain the 9900/9971 MOS well past MCRD (through boot leave, Marine Combat Training (MCT) and even into the initial MOS training at A-school). Conversely, although the GAR requirements for 0100, 0200, 0300, etc., reflect all time from boot leave through completion of A-school, the assignment process only awards those MOSs when the recruits are in A-school. Thus, if one graphs actual data, the onboard count is way *above* the GAR requirement for MCRD, but way *below* the requirement for the A-school training.

The Marine Corps needs an overarching indicator to measure whether the Corps is training to requirements. The Marine Corps has all the needed data fields for such an indicator. The Marine Corps just needs to ensure that the training MOS assignment policies match the

GAR's division of training requirements. To do this, the Marine Corps needs to:

- Adjust the GAR requirement for these training MOSs
  - — MOS 9900 and 9971 should reflect all training up to the start of A-school. Thus, the time should include MCRD, boot leave, and MCT for noninfantry Marines.
  - — MOSs 0100, 0200, etc., should reflect only A-school training.
- Adjust the assignment rules so that they are consistent with the GAR reqruiements
  - — Assign MOSs 0100, 0200, etc., promptly at the start of A-school.

Once these changes are made, we will be able to directly compare training requirements in each occupational field with the number of Marines being trained. Then, we will be able to answer the question: Are we putting Marines in the right MOSs?

Trends in time to train and time awaiting training

Although there have been various study efforts over the years, the Marine Corps has never had a performance measure for the efficiency of entry-level training. The study sponsor was particularly interested in the study team developing entry-level training metrics, so we focused considerable effort in this area. We were fortunate that the Marine Corps added a new data field to personnel records, the Date of PMOS Attainment, in the late 1990s. Schoolhouses enter this date once the Marine attains a PMOS. Our analysis shows that the information is reliable for PMOSs obtained since the summer of 2000. We call the street-to-PMOS the "time to train." It is the number of days from the beginning of boot camp to PMOS attainment. To calculate "time awaiting training," we subtract actual time to PMOS from the planned training time to PMOS.[7]

7. What we call "time awaiting training" is any difference between planned training days and actual average days (accession to the awarding of a regular PMOS). Planned training days for enlisted personnel account for recruit leave, transportation time, and so forth. Our planned training days for officers account for time waiting for The Basic School (TBS) to begin for officers on active duty.

Because many PMOSs graduate classes only a few times a year, our indicators are all 12-month averages. Using a 12-month average has two advantages: first, it includes all months, thereby eliminating seasonality; second, it can be updated monthly.

As part of the study effort, we have built a time-to-train database for our sponsors. It uses data from the total force data warehouse (TFDW) for both officers and enlisted and computes time to train, time awaiting training, number of Marines trained, and number of Marines whose training took longer than planned. Before discussing the PMOS-level data, however, let's look at the big picture.

How many man-years are devoted to entry-level training and to "time awaiting training"?

The Marine Corps devotes considerable resources to entry-level training. In the June 2001 through May 2002 period, the *man-years devoted to training* entry-level personnel (street-to-fleet) were:

- 19,688 for enlisted (an average of 8.2 months per Marine)
- 2,536 for officers (an average of 1.8 years per officer).

The *man-years awaiting training* (actual time spent was greater than planned) were:

- 4,716 for enlisted (an average of 59 days per Marine)
- 977 for officers (an average of 260 days per officer).

Thus, about 25 percent of the enlisted street-to-fleet time is unplanned,[8] whereas almost 40 percent of an officer's street-to-fleet time is unplanned. Each of these man-years represents a Marine who is *not* in an operating or supporting unit.

The time-to-train database will be updated monthly.[9] In addition to providing all the information in table form, the database produces a figure for each PMOS. For presentation purposes, we will introduce the information in the figure for Riflemen (PMOS 0311) in three stages (see figures 7 through 9).

8. If planned training time is unrealistically short, time awaiting training will be overstated.

9. The training chapter contains more information on this topic.

Figure 7 shows the planned training time (152 days). Dates are on the horizontal axis; above each date, averages for the previous 12 months will be displayed. We are eventually going to use both vertical axises. The left-hand vertical axis will measure days; the right-hand vertical axis will measure the number of Marines.

Figure 7. Time-to-train for O311s, background information

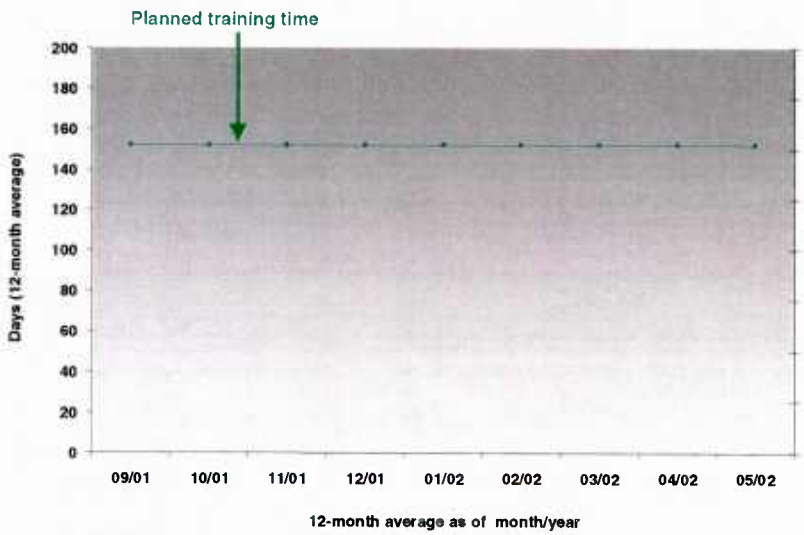


Figure 8 adds more information, including average actual training time. In May 2002, the average time to train 0311s over the previous 12 months averaged 172 days. In September 2001, the average for the previous 12 months had been 157 days. The shorter bars show the average "time awaiting training" (the sum of any training time that exceeded the planned time divided by the total number of Marines trained). Both average training time and the time awaiting training have been increasing for the 0311s.

Figure 9 shows the complete figure that the database provides, adding information on the number of Marines trained in the previous 12-month period. The axis for the number of Marines trained is on the right-hand side of the figure (here, 3,375 trained in the June 2001 through May 2002 period). Information is also provided on the number of Marines whose training time exceeded the planned training time. Riflemen's actual average training time has exceeded

planned training time over the entire period. Generally speaking, our analyses found that actual training time exceeds planned training time for most PMOSs. The situation for Riflemen seems to be worsening because proportionally more Marines exceed the planned training time for Riflemen at the end of the period than at the beginning.

Figure 8. Time-to-train for O311s, background information and training time

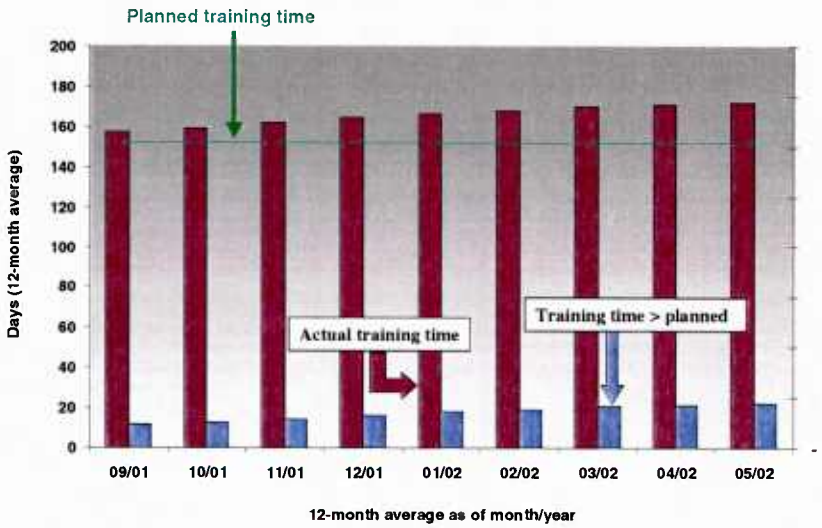
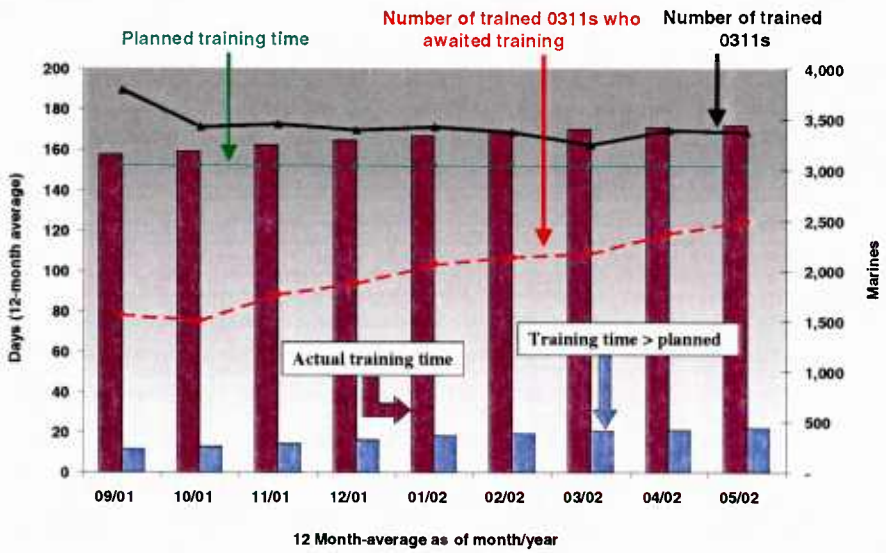


Figure 9. Time-to-train for O311s, complete picture from database

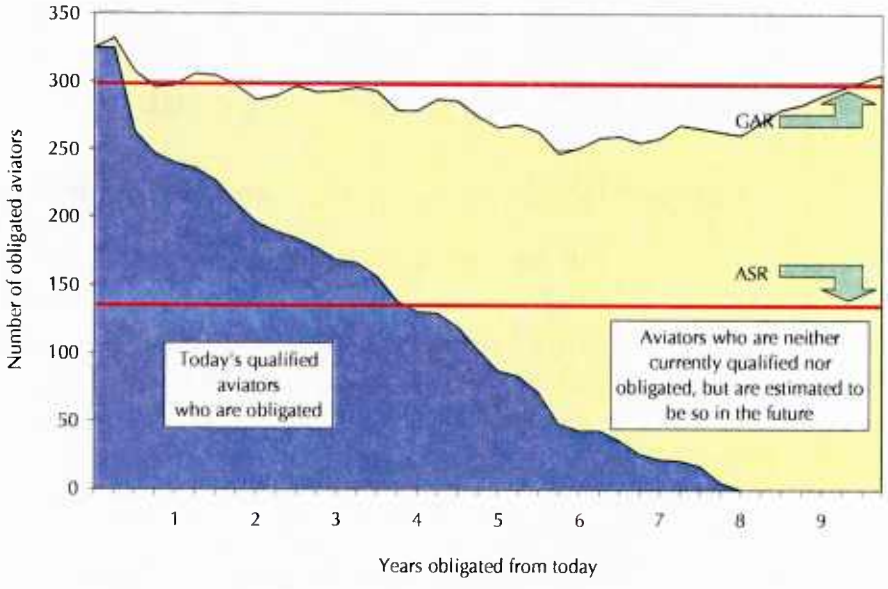


Later, we present a table with the June 2001 through May 2002 information for most PMOSs. *Fortunately, we can now regularly monitor this indicator, correcting data inaccuracies and focusing on reducing inefficiencies.*

Aviator inventory

The Marine Corps needs an aviator inventory forecasting indicator because of aviators' lengthy training pipeline and retention challenges. Curently, aviator personnel data in MCTFS lack a critical input—namely, an aviator's initial service obligation ending date. The Marine Corps accepted our recommendation to incorporate this information in MCTFS. Once these data become available, the Aviator Inventory Forecasting Model (AIFM) we developed can be used to indicate the health of the Marine Corps aviator inventory. Figure 10 shows what such a forecast would look like.[10] This indicator will provide aviation officer inventory planners with quantitative information to enhance both bonus policy guidance and winging assignment decisions.

Figure 10. Example of Aviator Inventory Forecasting Model output



10. The information in figure 10 is fictional because the information necessary to generate this chart is not yet available. In April 2003, the new data field should be operational in MCTFS and real data can be used to populate the model.

Dates for key inputs

This critical indicator is the set of planned and actual completion dates for those key documents whose updates are required if the manpower processes and subprocesses are to work. Here we want to focus attention on whether these documents are completed *on time. Lateness* is an indicator. For example, if the GAR is late, other plans based on the GAR may either be late or hastily completed, reducing the time necessary for quality control. We believe that, at a minimum, general officers in M&RA and CG, MCCDC should see this list of planned and actual completion dates on a regular basis. We encourage the readers of this report to both modify this list of key inputs and recommend any other general officers who should see the indicator. The documents include:

- Trooplist
- ASR
- GAR
- Memo 01 (Accession Plan)
- Budgetary submissions.

Critical indicators for processes or subprocesses

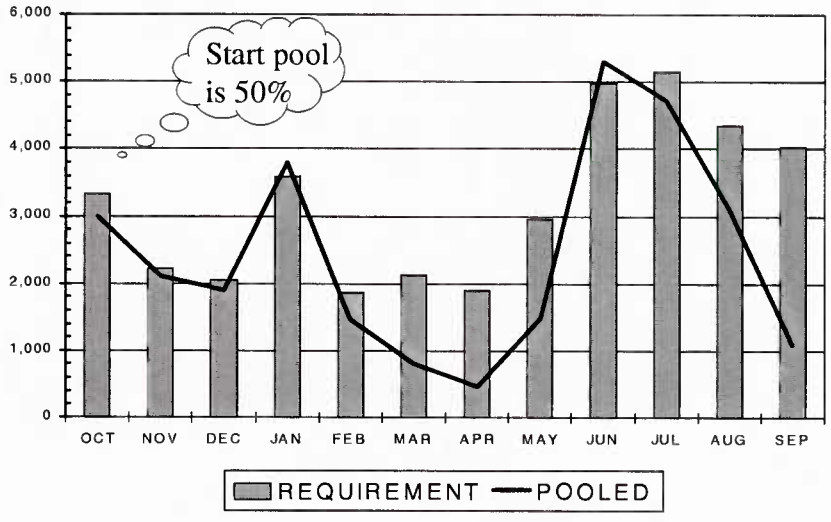
Recruiting: numbers, quality, and program requirements

For many years, Recruiting Command has presented regular monthly briefings that report numerous indicators. Some of these briefing slides have been presented at the Operations-Intelligence Brief and the Manpower Quarterly briefing. Figures 11 through 15 show some of MCRC's well-developed and important indicators of a critical manpower process.

First we look at the start pool size and placement relative to the recruiting mission. The start pool comprises those recruits contracted to begin training during the fiscal year, and is measured at the beginning of each fiscal year. Many analysts credit the start pool with a large portion of the Marine Corps success in maintaining accession quantity and quality during tough recruiting years. It is generally believed

that success requires a start pool of at least 50 percent.[11] Next we look at a point in the year, examining contracting and shipping for enlisted personnel, detailing goals, number obtained, and recruit quality (see figure 12). We've included figure 13 because it shows the number contracted for future months (the pool or those in the delayed entry program). This provides information on the health of recruiting for the rest of the fiscal year.

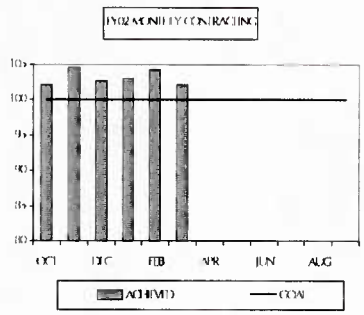
Figure 11. Start pool

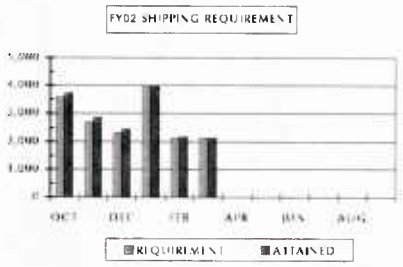


For many years now, the Marine Corps has exceeded its recruitment goals in all categories, and recruiting is in excellent shape. This may not always be the case, however, so it is important to have these indicators in place. Next we look at program attainment and officer procurement. Figure 14 presents requirements and year-to-date attainment for several enlistment programs. Figure 15 presents recruiting goals and progress for officers.

11. MCRC also has various measures in place to ensure that the start pool is "clean" (e.g., that it does not still include those recruits who no longer intend to join the Marine Corps).

Figure 12. Recruiting: contracting and shipping, April 2002





	FYTD
CONTRACTING FY02	103.2%
CONTRACTING FY01	103.2%
CONTRACTING FY00	101.9%

	FYTD
SHIPPING FY02	101.9%
SHIPPING FY01	102.4%
SHIPPING FY00	100.5%

QUALITY

TIER I HIGH SCHOOL GRADS (DoD GOAL 90%; USMC GOAL 95%)

FYTD	FY02	FY01	FY00
SHIPPED	97.1%	94.8%	93.7%
CONTRACTED	97.8%	96.4%	96.3%

MENTAL GROUP I-IIIA (DoD GOAL 60%; USMC GOAL 63%)

FYTD	FY02	FY01	FY00
SHIPPED	68.2%	64.3%	63.6%
CONTRACTED	70.4%	66.5%	66.5%

Figure 13. An example including year-to date shipments and the pool position for the rest of the fiscal year

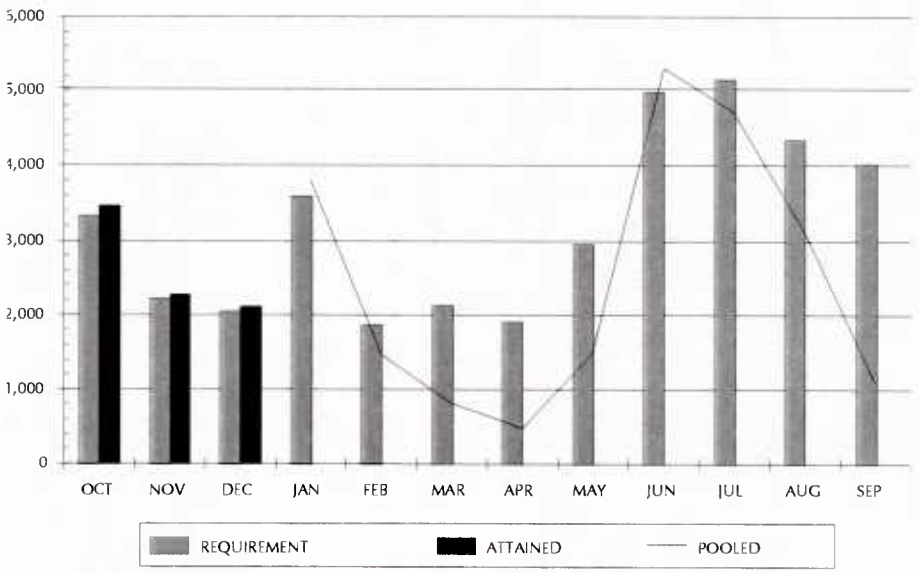
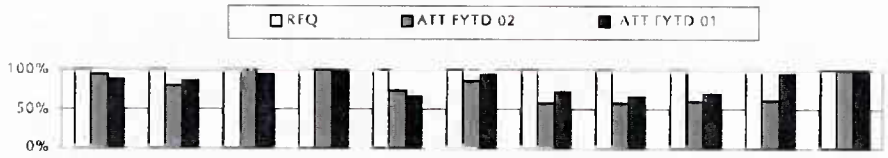


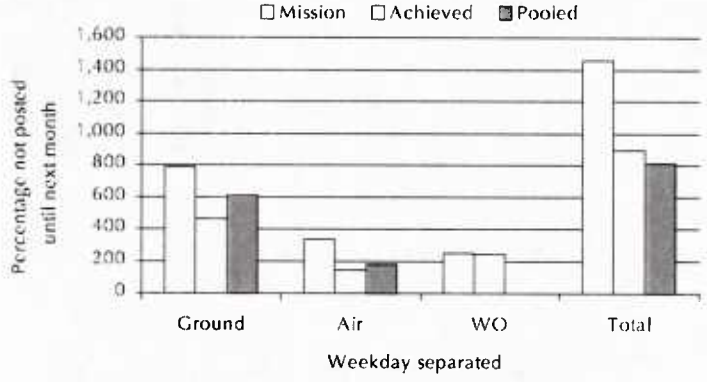
Figure 14. Essential MCRC program attainment: April 2002

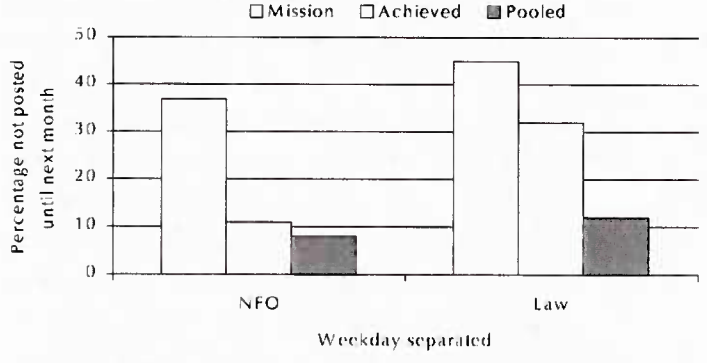


	TOTAL	AE	AE	AG	AJ/E1	BA/E7	BY/BZ	CJ	CK/E4	DC/E6	DD
REQ	8,063	964	1,829	395	447	1,484	905	1,106	331	164	438
ATT FY02	78%	80%	CLOSED	CLOSED	74%	88%	57%	58%	59%	62%	CLOSED
ATT FY01	88%	86%	93%	98%	66%	93%	72%	65%	70%	96%	CLOSED

AE – AVIATION SUPPORT
AJ/E1 – AVIATION OPS
CJ – LOGISTICS
DD – INTELLIGENCE
AE – AIRCRAET MECH
BA/E7 – AVIATION ELEC
CK/E4 – EIRE DIREC/CONT
AG – AIR CREW
BY/BZ – GROUND ELEC
DC/E6 – CRYPTO LING

Figure 15. Officer procurement results: second quarter 2002[a]





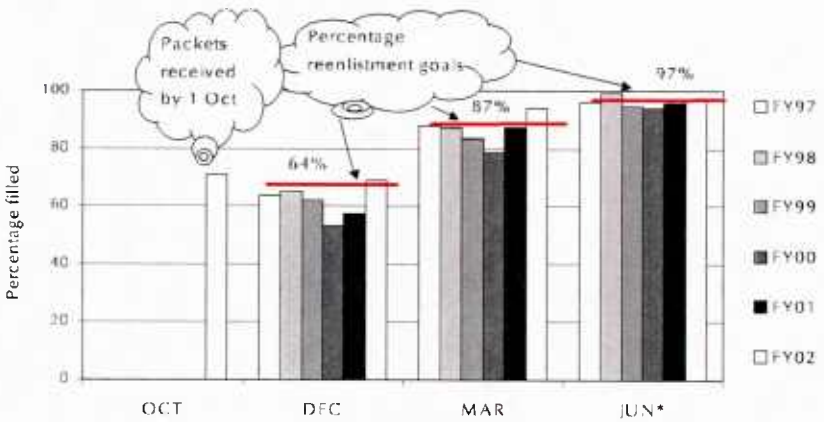
a. Note: Candidates selected for 180th OCC will make up differences in Air, NFO, and Law Missions.

Retention: FTAP, STAP, and SRBs

First-Term Alignment Plan (FTAP)

The historical and current-year progress for obtaining the required number of reenlistments are critical indicators. We have several years of first-term reenlistment data indicating how well the Marine Corps did relative to its FTAP numerical goals of 64 percent by December, 87 percent by March, and 97 percent by June. Figure 16 shows the FY02 information, benchmarked against historical data.

Figure 16. Tracking FTAP: critical indicator for fill



* FY02 data for June are as of 11 June.

We worked with the Enlisted Plans section to develop an indicator analogous to Recruiting Command's start pool indicator. For the indicator, we agreed on the number of reenlistment packets received before the start of the fiscal year. Marines may submit packages after July 1 for reenlisting the next fiscal year, so that processing can be completed before, and the reenlistment can occur on, 1 October. We lack historical data, but MMEA-6 reported they had received about 4,200 packets before 1 October 2001, the start of this fiscal year (see figure 16). Given the FY02 FTAP reenlistment requirement of 5,900, receiving 4,200 packets before the start of the fiscal year was a very good sign. And, indeed, the FY02 FTAP has been very successfully executed.

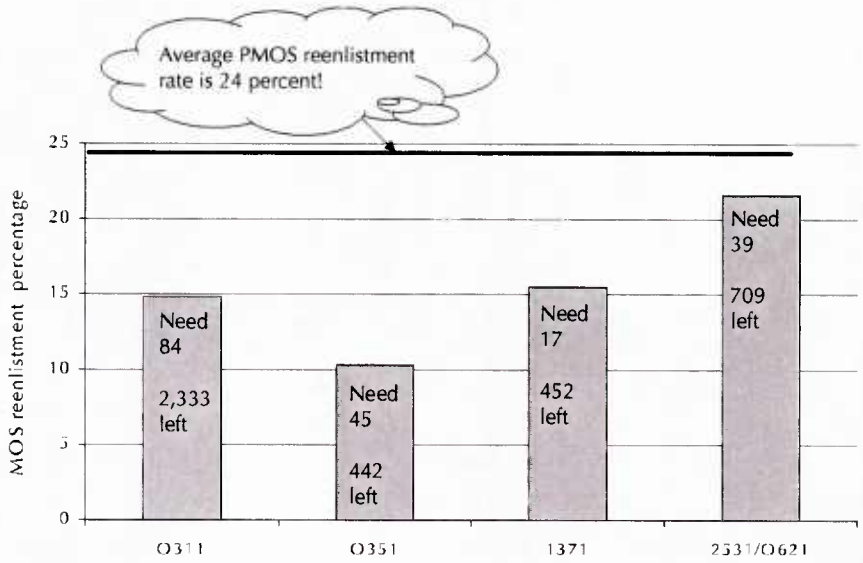
Figure 16 summarizes both the historical and current-year first-term reenlistment information. We propose an additional FTAP critical indicator for the February–April period. The indicator is *the number of regular Marines reenlisting in their PMOS as a percentage of those eligible to reenlist.*[12] It measures how well FTAP fulfills requirements by inducing Marines to reenlist in their PMOS instead of using lateral moves or prior-service accessions. Combined with the estimated number of end-of-active-service (EAS) Marines left in the MOS and an open MOS list, this indicator would clearly show where commanders and career retention specialists might most profitably make additional reenlistment efforts. It should also be made available to the DC M&RA and the Advocates.

We constructed such an open MOS list as of March 29, 2002, when the average reenlistment rate out of the EAS population was 24 percent. We focused on PMOSs with large remaining PMOS populations and at least 10 unfilled boatspaces. Figure 17 highlights some of these PMOSs, specifically those with below-average EAS reenlistment rates, such as PMOS 0351. At the end of March, PMOS 0351 had a reenlistment rate of just over 10 percent. There were 452 Marines who were eligible but had not yet reenlisted; the Marine Corps still needs 45 of them to reenlist to meet the FTAP requirements. We would anticipate that these critical indicators of EAS population reenlistment rates and remaining boatspaces would be most useful as an indicator to be calculated and distributed in early spring of each year.

Finally, we do not believe that the Marine Corps requires a critical indicator for FTAP "fit," meaning how well the reenlistments fit the specific MOS requirements. The FTAP is very well managed and, with the help of lateral moves and prior-service enlisted program (PSEP) Marines, the first-term reenlistments mirror specific MOS requirements.

12. This is not an indicator of fill because, in some cases, even if all eligible FTAP Marines reenlisted, the numbers would be insufficient to fill FTAP requirements.

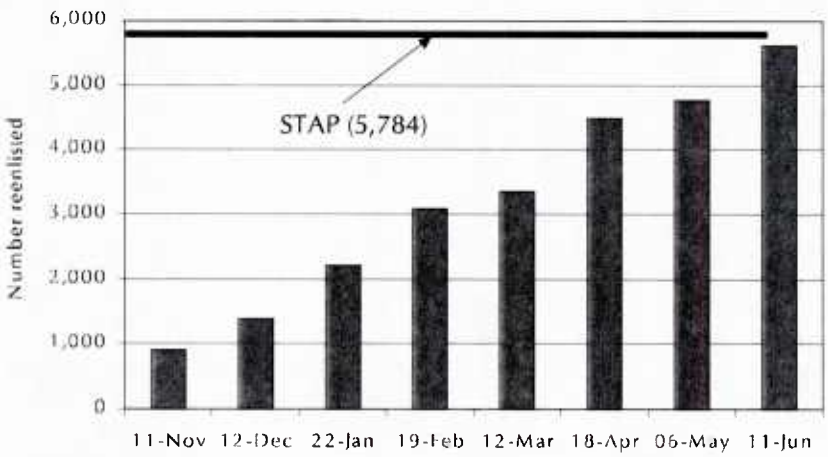
Figure 17. MOS enlistment rates for FTAP, 29 March 2002



Subsequent-Term Alignment Plan (STAP)

The STAP is new in FY02. It specifies the number of career force reenlistments the career force planner needs; it does not specify by which reenlistment—the second, third, fourth, or fifth. Figure 18 shows the year-to-date STAP data.

Figure 18. STAP goal and numbers reenlisted: FY02

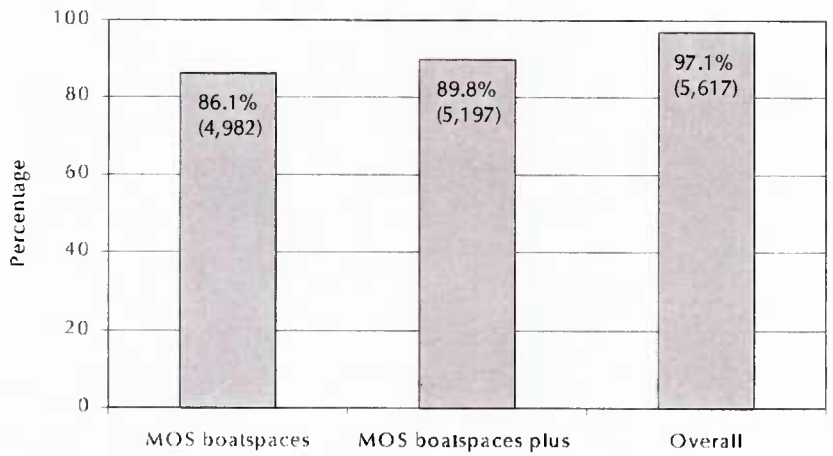


The Enlisted Plans Selective Reenlistment Bonus (SRB) and career-force planners have been working on indicators to judge how well STAP reenlistments fit specific MOS requirements. Although the Marine Corps carefully controls and manages first-term reenlistments to meet MOS requirements, career force reenlistments are available to all qualified Marines. Thus, even though the STAP has requirements by MOS, there is *no mechanism to ensure that career force reenlistments fit the career force requirements by PMOS.*[13] We propose that two of Major Ross's indicators be used for STAP fit:

1. *STAP MOS boatspace reenlistments.* This would be the number of Marines reenlisting who fill specific STAP requirements. It would mean that, if the PMOS STAP requirement were 35, and 40 career Marines reenlisted in that PMOS, only 35 of them would count for this indicator's requirement fit.
2. *STAP MOS boatspace reenlistments plus any reenlistments in "short" MOSs.* This measure would add to the STAP MOS boatspace reenlistments any additional reenlistments in career-force MOSs with a strength of less than 85 percent of requirements.

Figure 19 shows this information for FY02.

Figure 19. Fit and fill for the FY02 STAP of 5,784 Marines (as of 11 June 2002)



13. In fact, there is no mechanism to *prevent Marines reenlisting in excess of* the STAP number. Career-force reenlistments can't be shut down for the year the way first-term reenlistments can be closed out for the year.

Attrition: boot camp and first-term non-EAS attrition

Attrited recruits and Marines must be replaced, making attrition expensive. Still, some attrition is necessary because recruits or Marines failing to attain or maintain Marine Corps standards must be discharged. Identifying the optimal amount of attrition, however, is difficult. After many years of analyzing attrition, we have come to believe that an analyst's most important function is to highlight attrition rates that are significantly above or below historical norms. It is then the decision-maker who must decide if the current attrition rates are satisfactory. As a result, we think policy-makers should regularly look at overall attrition levels, relative to historical norms.

There are two general ways to examine attrition:

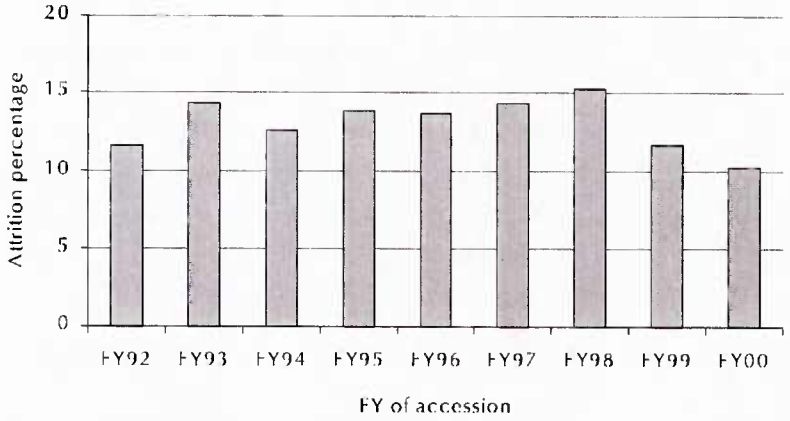
- *Cross-section:* the number of attrites out of a given population over a time period, usually a quarter or a year. The Commandant's attrition report uses this methodology, reporting attrition rates by commands.
- *Accession cohorts:* the number of Marines, who entered in a particular accession year, who attrite in a given period (by boot camp, by 24 months of service, etc.). This has been CNA's preferred method of analyzing attrition because it enables a more precise tracking of the attrited Marines' characteristics. We would suggest that such attrition calculations be part of our critical indicators.

We use MCRD and first-term cohort attrition rates[14] for regular accessions as the critical indicators. We show MCRD attrition rates in figure 20 and first-term attrition rates in figure 21.[15]

14. We use 45-month attrition rates for first-term attrition.

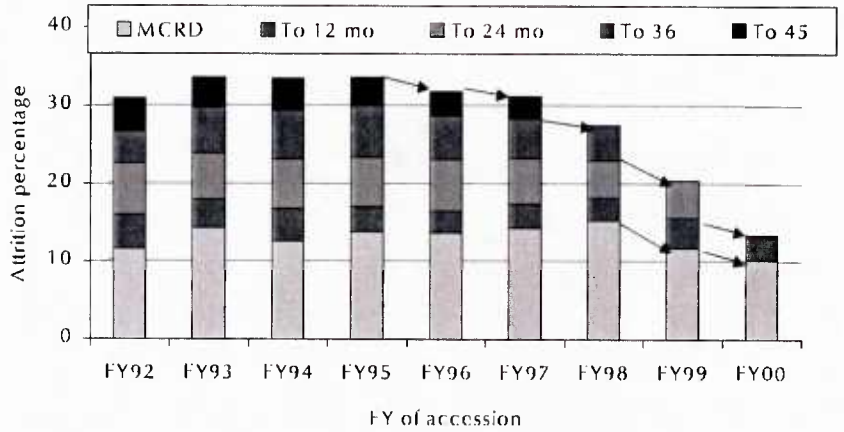
15. MCRD attrition is calculated individually for each recruit. Because some recruits take longer to finish or attrite from boot camp, we wait to calculate boot camp attrition until about 8 months after the end of the fiscal year.

Figure 20. MCRD attrition rates, by fiscal year of accession



Source: CNA Street-to-Fleet database.

Figure 21. Marine Corps first-term attrition rates, by fiscal year of accession



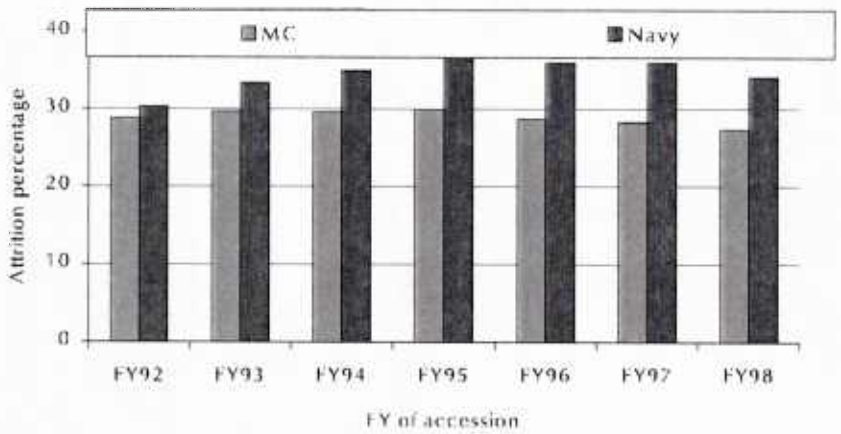
Source: CNA Street-to-Fleet database.

Attrition rates have been low in the Marine Corps for the last few years; we believe this is related to the importance that Marine Corps leaders have placed on attrition.

Reports to policy-makers should also include some comparison with the other services' attrition levels. This will indicate if Marine Corps

attrition levels are in line with those of the other services, and will illustrate the Corps' cost-effectiveness. Figure 22 displays Navy and Marine Corps non-EAS attrition rates for the first 36 months of service. Marine Corps attrition rates are clearly lower than those in the Navy. The current CNO has been emphasizing attrition-reduction during his tenure and there has been some reduction in Navy attrition (compare the FY95 accession cohort with the FY98 accession cohort). This CNO's tenure began with a Navy first-term attrition rate of 40 percent, a historical high. He is attempting to reduce this first-term attrition rate to 30 percent.

Figure 22. Navy and Marine Corps non-EAS attrition rates for the first 36 months of service, by accession cohort



Source: CNA Navy and Marine Corps Street-to-Fleet databases.

Meeting requirements

Strength and trained Marines

The officer and enlisted strength planners both plan and monitor monthly strength. The important month, of course, is September when all services must come within congressionally mandated strength limits (current limits are 2 percent over and 0.5 percent under). Because the Marine Corps wants to meet congressionally mandated levels, the endstrength planner's target is "just a little over" the endstrength level. Endstrength is important to the Marine Corps in terms of its dealings with Congress, so it receives considerable attention through regular reports on monthly strength, the projection for September strength (endstrength), and any policy changes that will need to be made to ensure that the numbers are met.

Without the congressional attention, would the September strength numbers be so important to the Marine Corps? No. Do the September endstrength numbers tell very much about the overall health of the Marine Corps manpower system? Maybe. We would argue that, in the short term, endstrength is only important "inside the beltway." In the long term, of course, it is important to all Marines that endstrength be met and Congress satisfied. What is more important, however, particularly to the operational and supporting establishment commanders, is the number of trained Marines (warfighters) the Marine Corps has at any point in time. These commanders can use only trained Marines. And, we believe that indicators for the number of trained Marines, or warfighters, have been neglected.

Finally, we believe that endstrength reporting should remain a separate task and not be folded into a critical indicator's brief. Endstrength reporting is extremely important, but it is not a critical indicator for the readiness of the Marine Corps as a whole.

Strength and warfighters

For our critical indicators, we propose comparing monthly strength numbers with a measure of the number of fully trained and available Marines. We call the latter *warfighters.*

A critical component of managing the manpower process is knowing how many Marines we have at each point in time (strength) and how many of them are trained and available for duty (warfighters). The leadership of the Marine Corps needs to be concerned with meeting congressionally mandated endstrength, whereas the key concern of the operational and supporting forces is the number of warfighters available throughout the year.

There are sharp seasonal variations in both the number of Marines and the number of available, trained Marines. Moreover, the seasonal patterns are different for officers than they are for enlisted. Better understanding of these seasonal patterns should help the manpower managers at HQMC and those in the operational forces and supporting establishment anticipate shortages, as well as times when staffing will be higher than average. Moreover, we recommend that these indicators be presented in such forums as the general officer symposium (GOS), the Commander's Course, and the G-1 Conference.

The strength numbers are from official Marine Corps historical files and follow official Marine Corps definitions. We define "warfighters" as those Marines with the following strength category codes:[16]

- 0: On duty in a billet that serves the overall mission of the command
- 1: Performing duty under instruction on TAD orders
- 2: Assigned duty as a formal school instructor
- 4: On TAD in excess of 30 days—not as a student

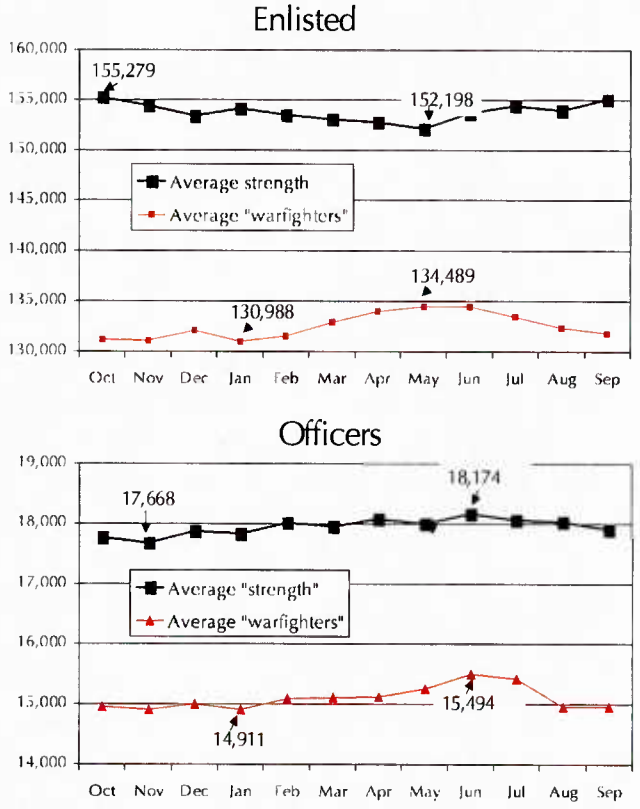
16. We obtained counts at various points in time for both strength category codes and duty status codes from our sponsors. Listings of these counts, by code and date, are available from the authors of this report.

- 5: Fleet Marine Force Personnel Assistance Program (FAP).

Discussion of strength and warfighter averages

Based on the last 3 years of monthly data, we built baselines for average monthly enlisted and officer strength and average numbers of warfighter Marines. These are shown in figure 23.

Figure 23. Enlisted and officer baselines: average strength and average number of warfighters



Enlisted personnel

Enlisted strength is at its *low point in May,* with 152,198 enlisted Marines. Strength *peaks in October,* at an average of 155,279 enlisted Marines. For the last few years, the Marine Corps has brought in about half of its enlisted accessions in June, July, August, and Septem-

ber, and the figure shows the resulting buildup in enlisted strength. This accession strategy has several advantages:[17]

- Accession quality is higher in the summer months when the high school diploma graduates want to enter the Corps.
- MCRD attrition rates, even after controlling for recruit quality, are lower for summer accessions. This is probably because the environment, with so many high-quality recruits, is particularly positive and focused on recruits becoming Marines.

There is, however, quite a different pattern for the number of enlisted warfighters. Although strength is highest in October, the number of warfighters is quite low because all the summer accessions are still in training. Although the lowest average number of warfighters has been in January (130,988), the January numbers are very close to the October and November averages (131,226 and 131,096, respectively). The number of warfighters is highest in May, when the accessions of the previous summer are fully trained.

Officers

The seasonality pattern for officer strength is almost the exact opposite of that for enlisted strength. Enlisted strength peaks at the start of the fiscal year, whereas the start of the fiscal year is the low point for officer strength. Similarly, enlisted strength is at its low point in May or June, which is the high point for officer strength.

Another sharp difference between officers and enlisted is in the relationship to the number of warfighters and strength. Enlisted Marines show very different seasonality patterns in these two measures, whereas Marine Corps officers show more similar patterns, with the number of warfighters peaking at about the same time as officer strength. Moreover, the seasonal variation in the number of officer warfighters is very large—slightly larger, in fact, than the variation in strength.

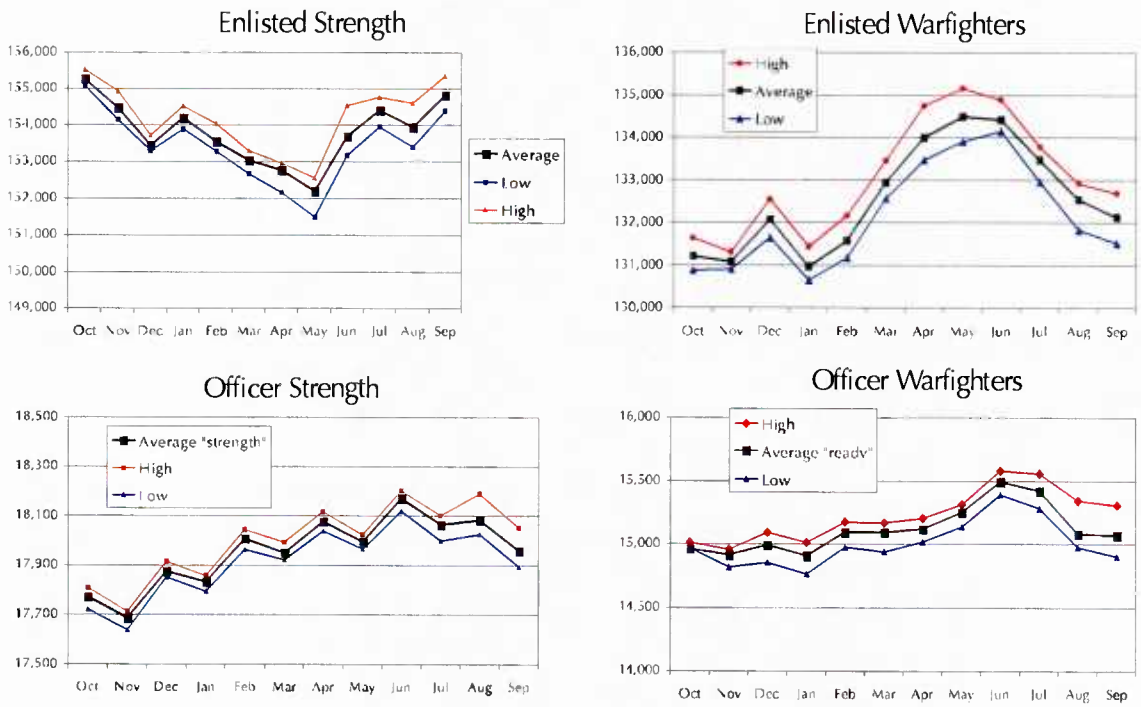
Next, let's turn to the regularity of these seasonal patterns.

17. Disadvantages include more seasonality in the number of warfighters and considerable seasonality for the training establishment.

Stability of seasonal patterns

We have long suspected that seasonality plays an important role, and that a better understanding of seasonal patterns would increase our ability to predict whether we were "on course" or headed for difficulties. As we show in figure 24, however, our suspicions are only valid if the seasonal patterns are relatively stable.

Figure 24. Seasonality in strength and warfighters: 3-year average and high and low points



We have information for the last 3 years for these two measures for officers and enlisted. The previous figure graphed the average strength. Here we show the average, as well as the high and the low for the month. The seasonal patterns are very regular, and the high and low bounds are close to the average.

We offer the following as an aside: *The zig-zag pattern for officer strength appeared odd to us, but officer planners assured us that it was not. A large number of officers access during May, June, and July, after the traditional*

graduation date for colleges.[18] *There are three officer candidate course (OCC) classes per year that create large accession numbers in December, April, and August.*

Most officer losses occur in July, August, September, and October. This is a combination of (a) the end of obligated service or retirement anniversary for officers who were originally commissioned during normal college graduations and (b) other officers who wait until the summer to retire, resign, or EAS because of their children's school years. In addition, OCC ground accessions have a 3.5-year commitment. Therefore, those not accepting augmentation will be summer losses if they graduated OCC in December or April.

We believe it unnecessary to formally estimate confidence intervals for the months.[19] If action officers preparing critical indicator briefs want to benchmark current-year data, we would advocate using monthly highs and lows for the past 3 years.

The purpose of this critical indicator is the relationship between the number of warfighters and the number of Marines. Action officers and Marine Corps leadership should be concerned if the historically stable relationships are not found in the current data, particularly if the gap between strength and warfighters appears to be widening.

Finally, we considered showing these relationships as percentages to avoid any confusion with this critical indicator and September end-strength calculations. Unfortunately, the percentages do not capture the tension between the seasonality of strength and the differing seasonality of warfighters.

In summary, we believe that understanding seasonality will help managers and commanders deal with these fluctuations in the number of warfighters.

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18. These include accessions in the PLC, MECEP, NROTC, and USNA programs.

19. There are other problems with trying to construct confidence intervals. One really needs more than 3 years of data for confidence intervals. Using older data, however, is problematic because we believe that behavior has changed in recent years.

Overall number of trained Marines by grade and MOS

This section presents a family of potential overarching indicators meant to gauge how well the current inventory of MOS-qualified Marines matches stated manpower requirements. In general, how closely these match is characterized by "fill" and "fit." Fill refers to the size of the personnel inventory compared with the size of the manpower requirement. Fit refers to how well the inventory meets the skill (MOS) and experience (grade or years of service) requirement. How well the inventory fits and fills the stated requirement is a good aggregate measure of how well the manpower system is working because the stated requirement is the basis for manpower plans and the inventory is the end result of how plans have been executed.

The entire system is dynamic and it is not likely that the inventory will ever match the requirement in terms of both fill and particularly fit. That is, the requirement changes slightly each year, plans incorporate assumptions about future human behavior and thus have a element of uncertainty, and execution is rarely perfect. When viewed over a period of time, however, an aggregate comparison of inventory and requirements will provide some insight into how closely they match and whether they are converging or diverging.

Our overarching indicator compares the GAR (grade-adjusted recapitulation)[20] with the monthly count of Marines for all grade-MOS combinations. We aggregate this comparison for various groupings of MOSs and grades that we believe make sense. The fill is measured by comparing the onboard Marines in a given grade-MOS group. We measure the fit for each grade-MOS combination as the

$$\text{minimum}(onboard, GAR).$$

This is a count of Marines in a particular grade-MOS combination that are filling a GAR requirement. Those Marines in excess of the GAR requirement for a particular grade-MOS combination are not counted in grade-MOS fit. In other words, grade-MOS fit is a count of how well the system has produced an inventory that exactly matches the GAR requirement.

20. We use the most recent GAR for the current fiscal year.

For different grade-MOS groupings, we calculate "grade-MOS fit" as

$$\sum_{\text{grade-MOS group}} \text{minimum}(\textit{on-board}, \textit{GAR}).$$

We believe that these aggregated overarching indicators complement the detailed grade-MOS information that the enlisted endstrength planner maintains, and our aggregated measures better summarize how well the current inventory meets the stated requirement.

Figure 25. E1-E9 nontraining MOSs: GAR vs. onboard vs. grade-MOS fit

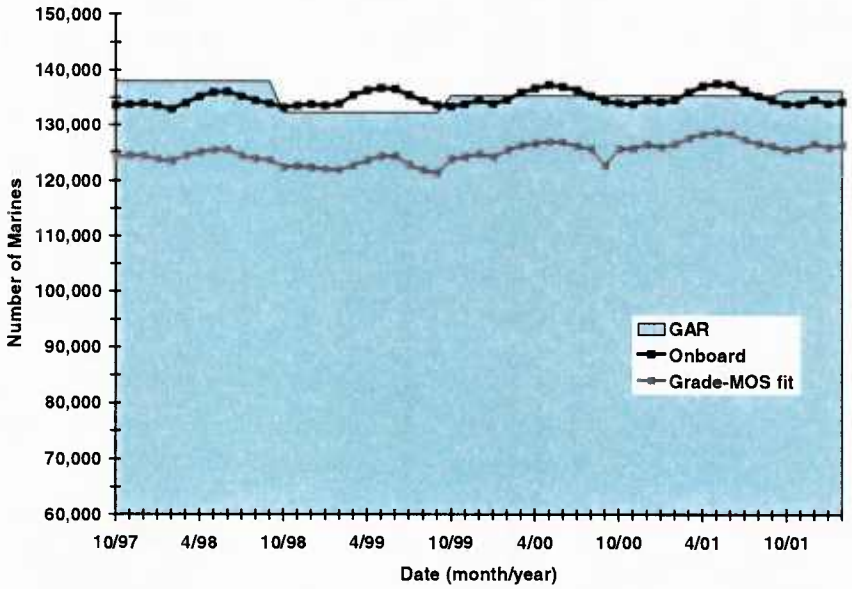


Figure 25 above graphs three quantities, by month, for enlisted grades E1 through E9 for all nontraining primary MOSs:[21]

21. *Nontraining MOSs* is a nonstandard term. We include all MOSs except training MOSs and so-called special MOSs among nontraining MOSs. Training MOSs are those that end in 00, which are assigned to Marines in primary MOS training, and MOSs assigned to Marines in recruit training and Marine Combat Training. Special MOSs are very small and include the Marine Band and Marine Drum and Bugle Corps. See appendix A for a table of MOSs.

- The GAR requirement
- The number of regular component Marines
- Grade-MOS fit.

The GAR has changed a little during the period covered by our data but the inventory has remained relatively constant with a familiar, accession-driven seasonal pattern. The aggregate grade-MOS fit has also been relatively constant, hovering around 90 percent during the entire period.

Enlisted Marines

We believe that the comparison of the enlisted Marine requirement and the fit and fill of the inventory is made best in three groupings: (1) E1-E3s in nontraining MOSs, (2) E4-E5s in nontraining MOSs, and (3) E6-E9s in nontraining MOSs.

The figures that follow present these comparisons. For some figures, we have chosen to display the comparisons as a percentage of the GAR requirement, rather than the actual number, because it is easier to see how the onboard and grade-MOS fit compare. Furthermore, the GAR for these grade-MOS groupings has not changed much from year to year (on the order of 2 to 4 percent).

Figure 26 shows the comparison for E1-E3 nontraining MOSs. Because almost all of the E1-E2 population is in training, the inventory is made up almost entirely of E3s. However, the GAR lumps these grades together. Over the 5-year period we examined, the grade-MOS fit exceeds 90 percent only during the period when the fill is greater than 100 percent. Even when the fill is below 100 percent, as it has been during FY02, the grade-MOS fit is around 90 percent, roughly equating to 4,000 E1-E3s in MOSs with inventories in excess of the GAR requirement.

Figure 27 presents the comparison for E4-E5 nontraining MOSs. Although the inventory has not exceeded the GAR for the past 24 months, the grade-MOS fit has been within 1 or 2 percentage points of the inventory for that period. This means that the number of E4-E5s in MOSs whose inventory exceeds the GAR number less than 1,000 (out of the GAR requirement of over 52,000).

Figure 26. E1-E3 nontraining MOSs: onboard and grade-MOS fit as percentage of GAR

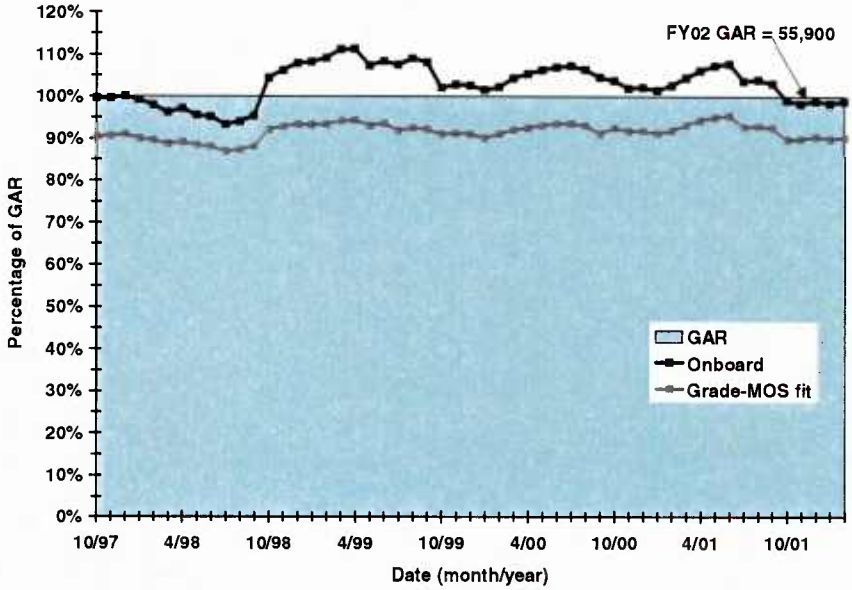


Figure 27. E4-E5 nontraining MOSs: onboard and grade-MOS fit as percentage of GAR

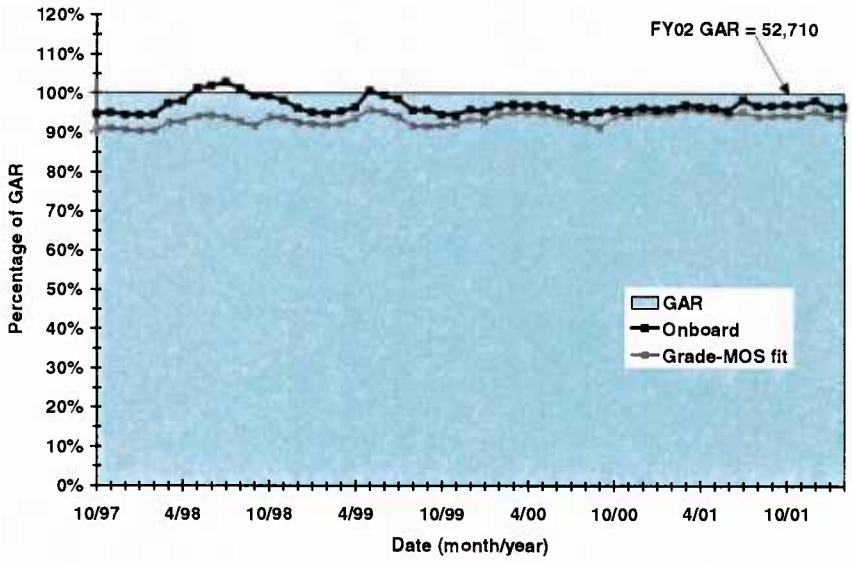
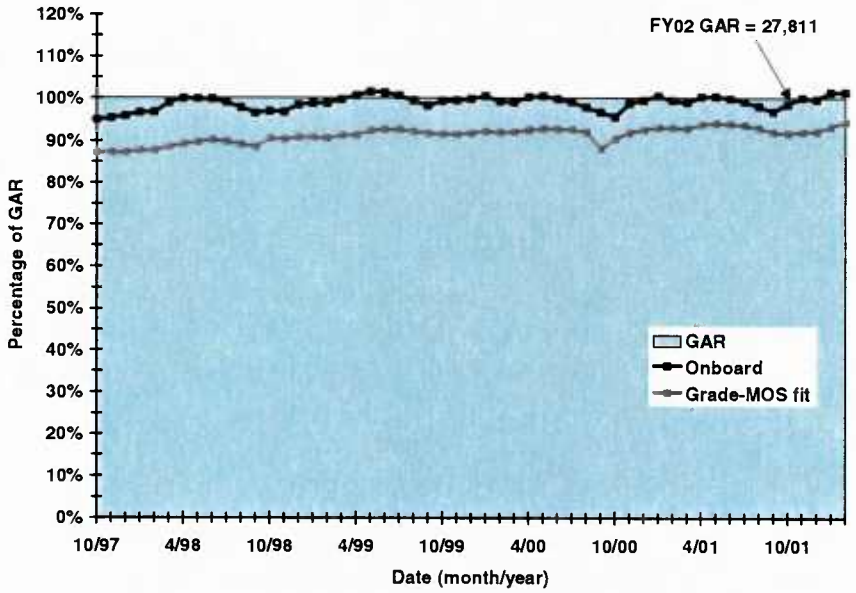


Figure 28 presents a comparison of requirements and inventory for E6-E9 nontraining MOSs. The inventory matches the GAR very closely over this 5-year period, both in terms of fit and fill. In the past 24 months, the grade-MOS fit has been about 93 to 94 percent.

Figure 28. E6-E9 nontraining MOSs: onboard and grade-MOS fit as percentage of GAR



Officers

We also developed measures that compare how well the officer inventory fills and fits the nontraining MOS, GAR officer requirement. For purposes of comparison, we group officers into seven different groups of MOSs, which are often used for planning and inventory management purposes:

1. Combat arms
2. Fixed-wing pilots
3. Rotary-wing pilots
4. Naval flight officers
5. Logistics

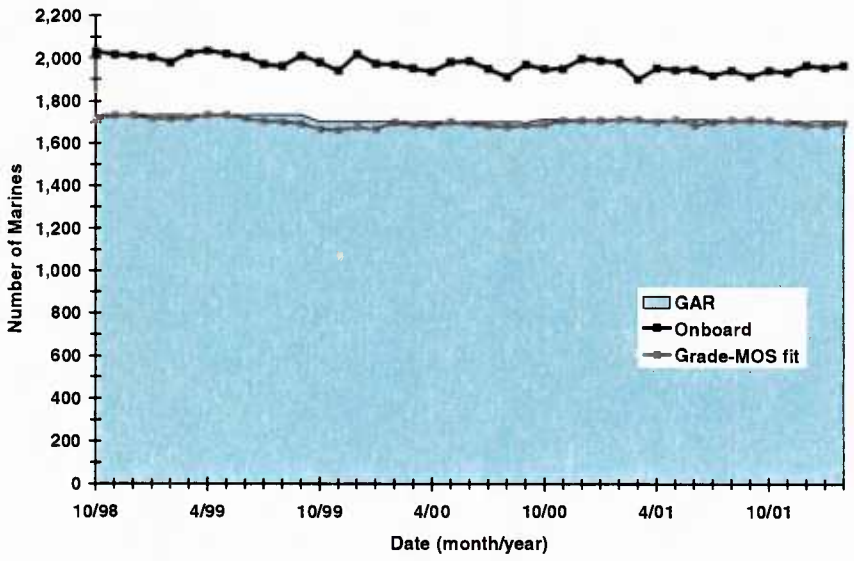
6. Command, control, communications and computers (C4I)
7. Combat service support.

We compare these MOS groups separately for O1-O3s, O4-O5s, and O6s. The GAR groups O1s and O2s together, so our comparison of O1-O3 inventory and requirements for nontraining MOSs includes mostly O2s and O3s.[22] Because the GAR and inventory numbers are much smaller than those for enlisted Marines, we use the actual counts, rather than percentages, for this overarching indicator.

In the pages that follow, we present the comparisons for combat arms, rotary-wing pilots, and C4I officers. The other comparisons can be found in appendix A.

Figure 29 presents the inventory and requirements comparison for O1-O3 combat arms officers. The onboard exceeds the GAR requirement by about 20 percent, or 350 to 400 officers for the period from FY99 through the present. The grade-MOS fit is almost identical to the GAR, which is not surprising given the surplus in these MOSs.

Figure 29. O1-O3 combat arms: GAR vs. onboard vs. grade-MOS fit



22. For pilots and NFOs, this comparison includes mostly O3s.

Figure 30 presents the same comparison for O4-O5s. Here also, the inventory exceeds the GAR by about 300 officers for the entire period, and the grade-MOS fit is nearly identical to the GAR.

Figure 30. O4-O5 combat arms: GAR vs. onboard vs. grade-MOS fit

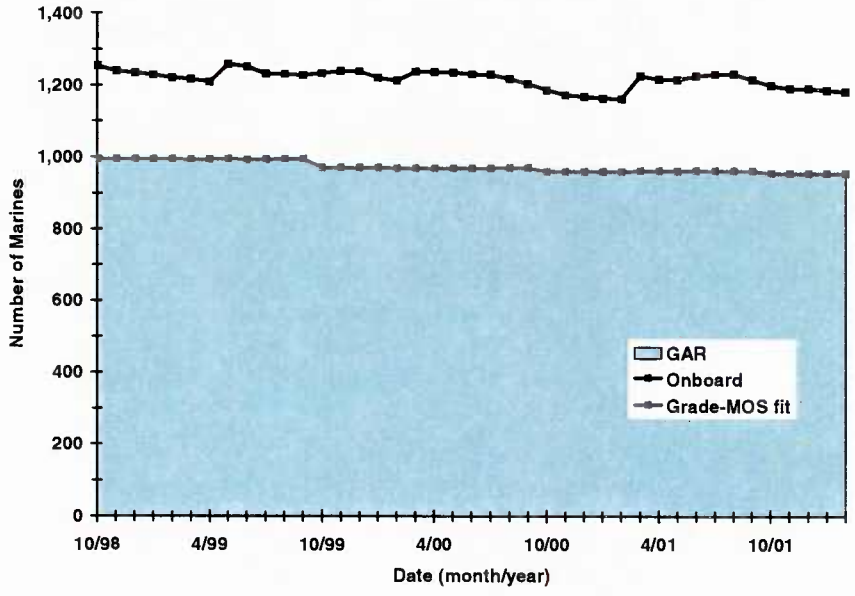


Figure 31 compares the GAR requirement with onboard O1-O3 rotary-wing pilots. While the GAR has decreased since FY99 by about 10 percent, the number of onboard and grade-MOS fit have remained relatively constant, resulting in better percentage-wise fill and fit. However, there has been a persistent shortage.

The decrease in the GAR appears to result primarily from a decline in the GAR requirement for O3 CH-46E pilots (MOS 7562).

Figure 32 shows a very different story for O4-O5 rotary-wing pilots. There has been a growing surplus relative to the GAR, which has declined slightly since FY98. However, while the onboard *surplus has grown*, the grade-MOS *fit has declined* in recent years. Although the numbers are small, this suggests that the surplus has grown in the "wrong" rotary-wing MOSs.

Figure 31. O1-O3 RW pilots: GAR vs. onboard vs. grade-MOS fit

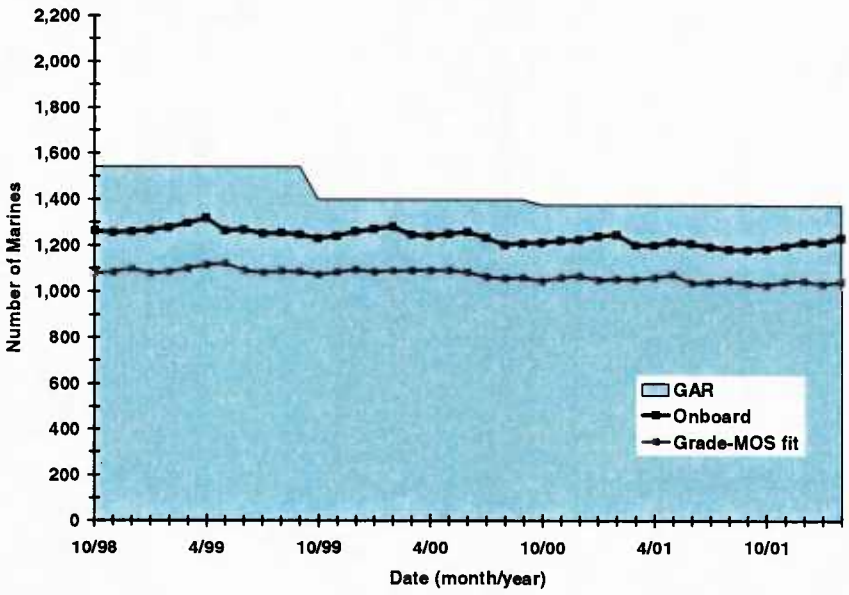


Figure 32. O4-O5 RW pilots: GAR vs. onboard vs. grade-MOS fit

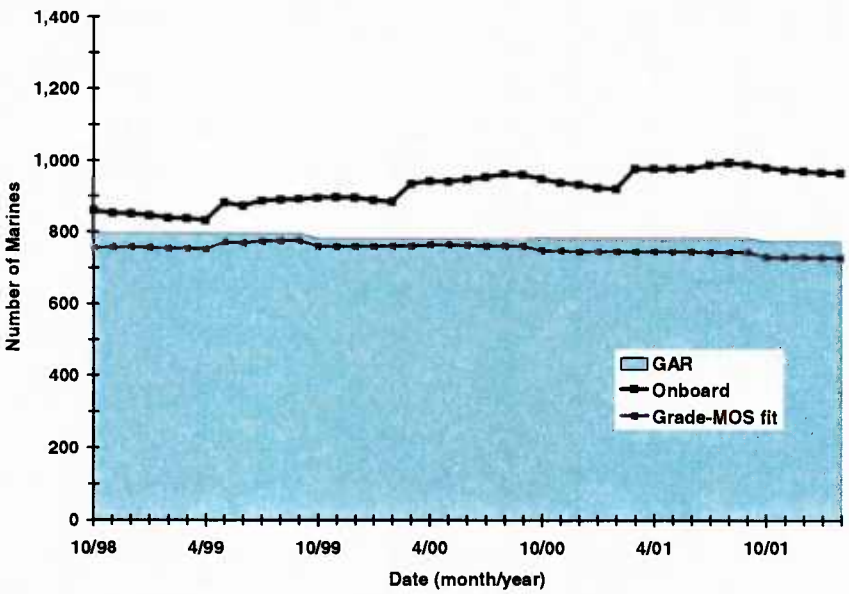


Figure 33 presents the comparison of GAR requirements with onboard and grade-MOS fit for O1-O3 logistics officers. The GAR has remained almost constant since FY98, while the inventory has increased dramatically, from a 10-percent deficit to a 10-percent surplus relative to the GAR. This is an increase of about 400 onboard officers, or more than a 20-percent increase. The grade-MOS fit has improved as well in the same time period.

Figure 33. O1-O3 logistics: GAR vs. onboard vs. grade-MOS fit

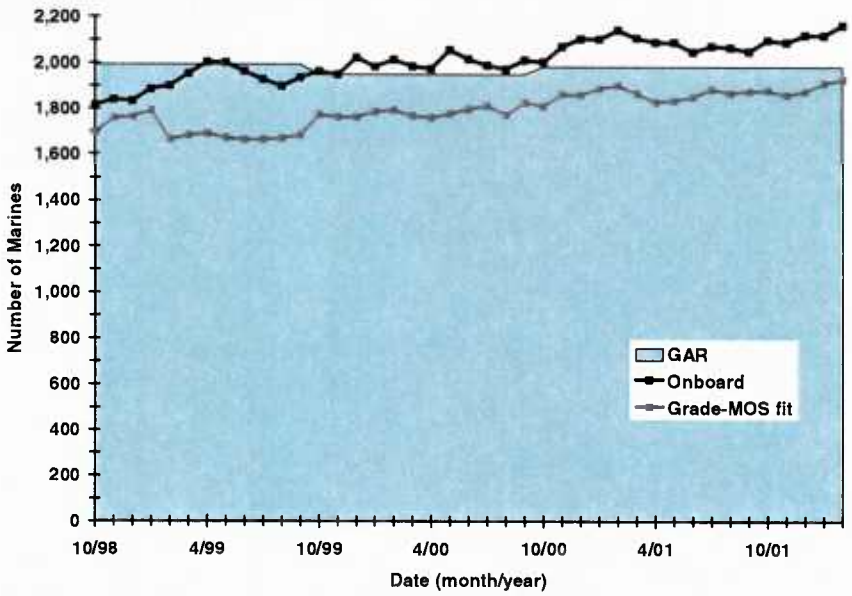


Figure 34 presents the same comparison for O4-O5 logistics officers. The GAR requirement has increased about 5 percent since FY98, whereas the onboard count has remained relatively constant. The grade-MOS fit has been almost identical to the onboard throughout this period, which means that there is no single O4-O5 logistics MOS with a significant inventory surplus.

Figure 35 presents the comparison for O6 combat arms, aviation, and logistics MOSs. The chart shows that there has been a small surplus in recent years and the MOS fit is very good. These GAR data include all O6s except for approximately 45 judge advocate officers (JAOs) and fewer than 5 other O6s.

Figure 34. O4-O5 logistics: GAR vs. onboard vs. grade-MOS fit

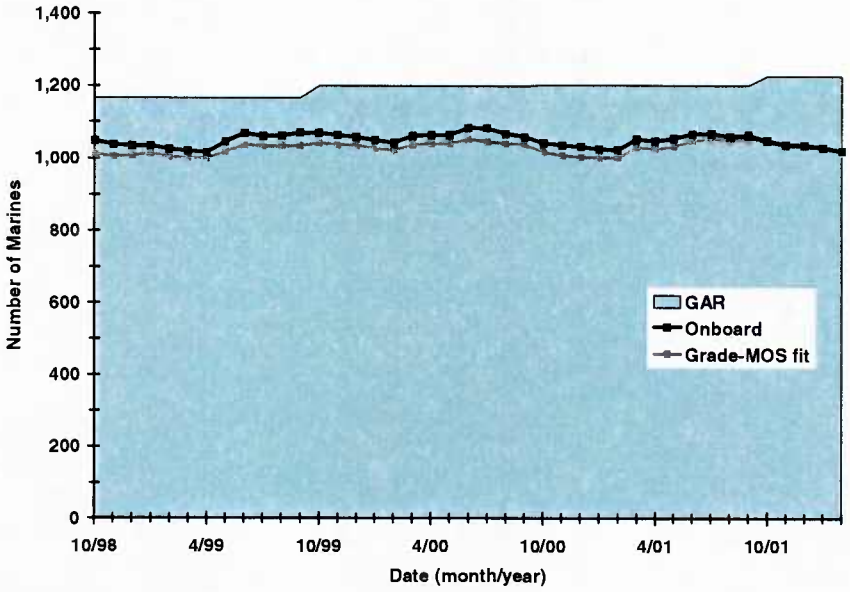
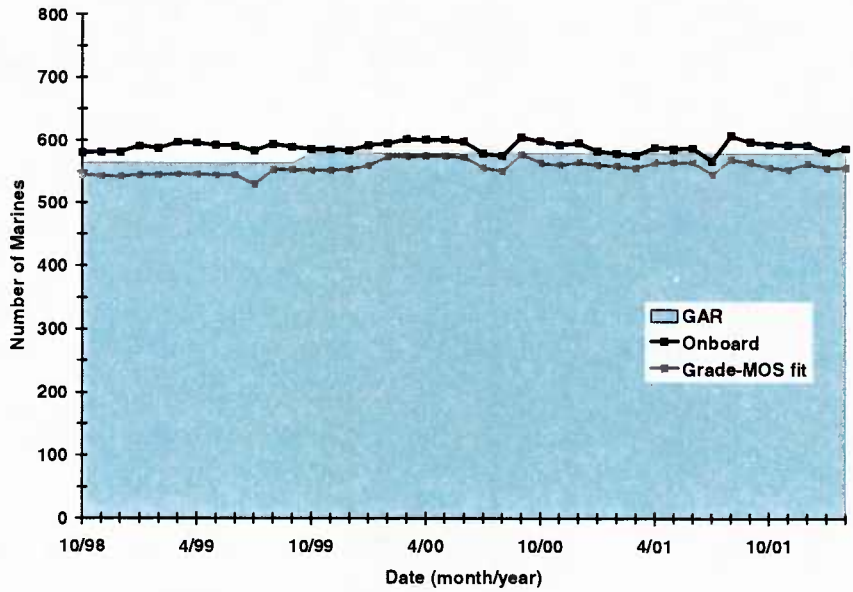


Figure 35. O6 combat arms, aviation, and logistics MOSs: GAR vs. onboard vs. grade-MOS fit



Marines in entry-level training

General Krulak used to say that the Marine Corps does two things for the nation:

- Make Marines, and
- Win battles.

We currently use the attainment of the accession mission, MCRD attrition, and the overall success of the classification plan to evaluate the efficiency of the Marine Corps' first task: making Marines. These are probably the most important metrics, but we believe we can improve our ability to evaluate how well we make Marines by also developing a mega-indicator for Marines in training and training requirements. In addition, we want to identify problems and potential inefficiencies in the training pipeline by looking at the time to train Marines and time awaiting training. *Neither time to train nor time awaiting training have been measured systematically in the past.* We turn first to Marines in training.

Entry-level training requirements and entry-level training

The primary means by which the manpower system can shape the personnel inventory is through accessions. This section further develops the metrics that measure how well accessions are channeled into MOSs to match requirements. Specifically, we examine an aggregate measure of how well the GAR requirement for Marines in MOS-training matches the inventory of Marines in those training MOSs.

This may appear identical to our proposed overarching indicators comparing the GAR requirements and inventories of MOS-qualified Marines, but there are at least two differences:

- For boot camp and training MOSs, the GAR is an annualized requirement expressed in man-years, whereas our monthly count of the inventory in these types of MOSs is the actual

number of Marines with boot camp and MOS-training MOSs in that given month. (For our overarching indicator of MOS-qualified Marines, both measures are strength counts.) Fortunately, having the GAR requirement in man-years and the inventory counts in actual numbers is not a serious problem.[23]

- The clarity of the overarching indicator for MOS-trained Marines is lacking for Marines in training. This is because the inventory changes for MOS (from the generic training MOSs of 9971 and 9900 to the occupational field training MOSs of XX00) do not match the GAR changes (from the generic training MOSs of 9971 and 9900 to the occupational field training MOSs) of XX00. *This mismatch problem in the timing of MOS changes will have to be corrected if this indicator is to become useful.*

Figure 36 compares the E1-E3 GAR requirement for recruit training with the monthly count of Marines in those MOSs and a 12-month moving average count of Marines in those MOSs for the preceding 12 months. Recruit training MOSs are 9971 (basic Marine with a program guarantee) and 9900 (basic Marine on an open contract).

The onboard count shows the familiar seasonal pattern of accessions and is very stable in its seasonality with almost 50 percent of accessions entering in the summer. The 12-month moving average is basically flat, reflecting fairly stable accession numbers over the last few years. Onboard strength, however, is much greater than the GAR requirement at all times.

The problem is that Marines retain the recruit training MOSs (9971 and 9900) well after they complete boot camp (through boot leave, Marine Combat Training, etc.).[24] This causes a problem because in the GAR these recruit training MOSs represent only recruit training.

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23. If, for example, 10,000 Marines were to be trained in an MOS requiring 3 months training, the man-years of training for this MOS would be 2,500. The *average* actual onboard count for Marines would also be 2,500. Because of seasonality, however, the actual onboard count will go above and below the 2,500 line.

24. This is supported by our analyses of accession date to assignment of an entry-level training MOS.

From the point of view of GAR requirements, when new Marines transfer from an MCRD to their next duty station, they should have the 9971 or 9900 PMOS removed from their record and be assigned the training MOS associated with their intended primary MOS (for example, 0300 or 0800).

Figure 36. E1-E3 recruit training: GAR vs. monthly onboard and average onboard

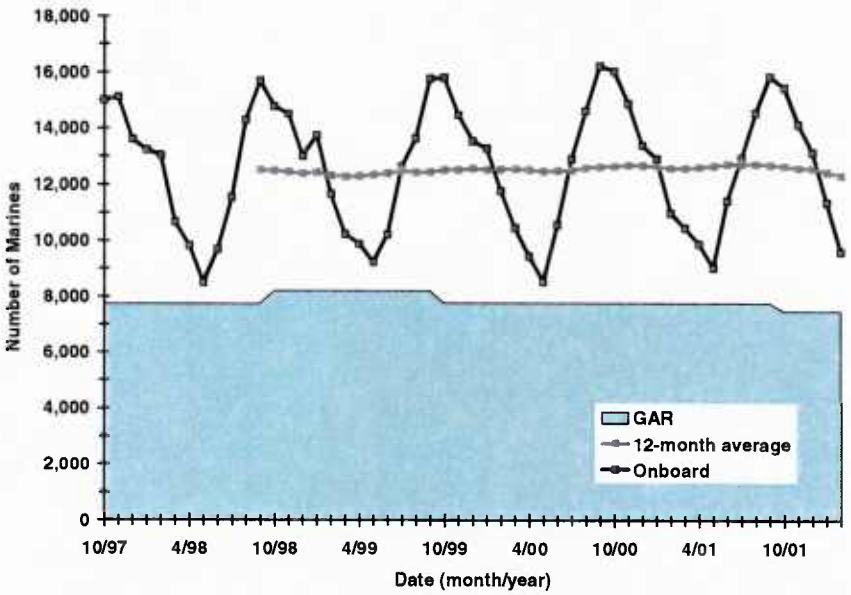


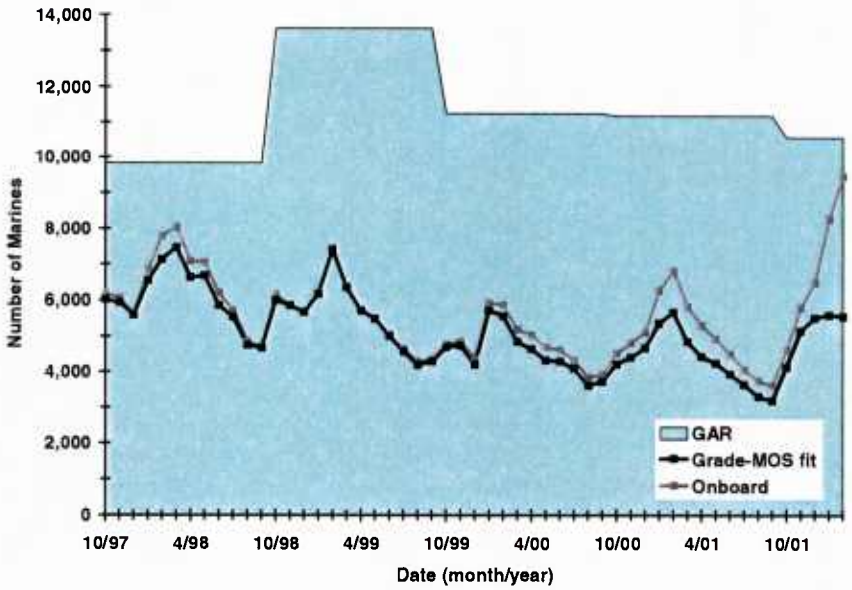
Figure 37 compares the GAR with the inventory for XX00 training MOSs. Here we see the exact opposite of figure 36 with the GAR requirement substantially in excess of the onboard. Again, while the GAR requirements for training MOSs appear to encompass everything after bootcamp graduation, inventory counts show that the Marine appears to acquire the training MOS only when he or she shows up at the MOS schoolhouse. Although there are two ways to reconcile the GAR requirements and the entries in a Marine's PMOS field, we strongly recommend the second method:

1. On boot camp graduation, change the Marine's PMOS field to reflect the occupational field in which he or she will be trained.

Not all training assignments are solid at this point, however, so this solution is not optimal.

2. Change the GAR requirements for 9971 and 9900 to reflect all the time until the Marine arrives at PMOS school. Then, ensure that the training MOS (0100, 0200, 0300, etc.) is entered on the first day the Marine begins A-school. We believe that this is the best change to make.

Figure 37. E1-E3 MOS training:[a] GAR vs. monthly onboard and average onboard



a. Does not include MOSs 9900 and 9971 (recruit training).

Once the GAR MOS requirements reflect the way the inventory is assigned MOSs, we will have an excellent overarching indicator for how well the manpower system is working to put new Marines into required MOSs. If the system were putting new Marines into a particular training MOS in excess of the GAR requirement, that would show up as a divergence between the monthly onboard counts and the grade-MOS fit.

Establishing this mega-indicator will require some work, but we believe that the effort will be extremely worthwhile. It is a simple indicator and will be easy to calculate. It will give us the ability to see, in real time, if we are training sufficient numbers of 03s, 08s, 02s, and so on. *It will be a summary statistic of whether we have put our new Marines into training paths that reflect Marine Corps requirements.*[25]

Efficiency of initial skill training: completion of initial MOS training

Average time to train

The date of PMOS attainment was added to MCTFS a few years ago. Schoolhouses enter the information when Marines attain a PMOS. Though there are many "junk" dates in the field, this field's data seem quite accurate for new accessions who attained their PMOS from October 2000 to the present.[26]

Our time-to-train is a true street-to-fleet calculation. We calculate time-to-train as follows:

- For enlisted personnel, it is the difference between the date of PMOS attainment and the active duty base date (ADBD).
- For officers, it is the difference between the date of PMOS attainment and the commissioning date.[27]

25. Figure 6 illustrates how this indicator will look once the requirements and personnel data are aligned.

26. The field will be overwritten whenever a new PMOS is attained, but we don't believe that this will be a problem, given the way we are constructing the indicator. We do, however, urge that subject-matter experts perform a quality check on the schoolhouses' data entry. We have checked the time-to-train calculations derived from this date with earlier, time-consuming calculations of time-to-train and found them very similar.

27. For some officers with particular source-of-entry codes, we substitute the current active duty base date for the commissioning date. A good example would be lawyers.

With the help of the Integration Section in MP, we have built a database from the Total Force Data Warehouse (TFDW). The database calculates the time-to-train by PMOS and will be updated monthly. For each PMOS, we calculate the average of the time to train over the preceding 12 months. We use a 12-month average because many schoolhouses have graduations only a few times a year. An additional advantage of a 12-month average is the lack of seasonality because each average represents the full 12 months.

The data can be organized by officer PMOSs, enlisted PMOSs, all PMOS, individual PMOSs, and so forth.

Average time awaiting training

Our sponsors were particularly interested in time awaiting training, which represents wasted resources and cannot be systematically tracked. This is an entry-level training measure of efficiency—not just for the training establishment, but the entire street-to-fleet process. Ideally, when new Marines show up at a School of Infantry (SOI), for Marine Combat Training (MCT) or infantry MOS training, they are assigned to a class and immediately begin training. However, some Marines inevitably spend time at schools in a "not-under-instruction" status. This may happen for numerous reasons, such as (a) a small number of classes for a given, small entry-level MOS; (b) fewer available school seats in a class than the number of Marines classified into a given MOS at a given point in time; and (c) problems with a Marine's qualifications.

We still cannot calculate time awaiting training directly,[28] but, with the calculations of average time to train, we can calculate it indirectly. Specifically, time awaiting training is the difference between planned

28. Training Command includes some information on time awaiting training in the new SITREP. Schools are required to report the number of Marines in an awaiting-training status in various ranges (7-30 days, 31-60 days, more than 60 days) with an explanation of why those Marines are in that status. This snapshot information cannot be used to estimate total time awaiting training but may provide insight into causes. Combining our calculations for total time awaiting training with TECOM's new SITREP should prove profitable.

training time and the actual average training time. If the planned training time (from boot camp though the completion of PMOS training) is 170 days and the average observed time is 180 days, there are 10 days awaiting training. If the student completed the course on time or in less time than was planned, we define their time awaiting training as zero.

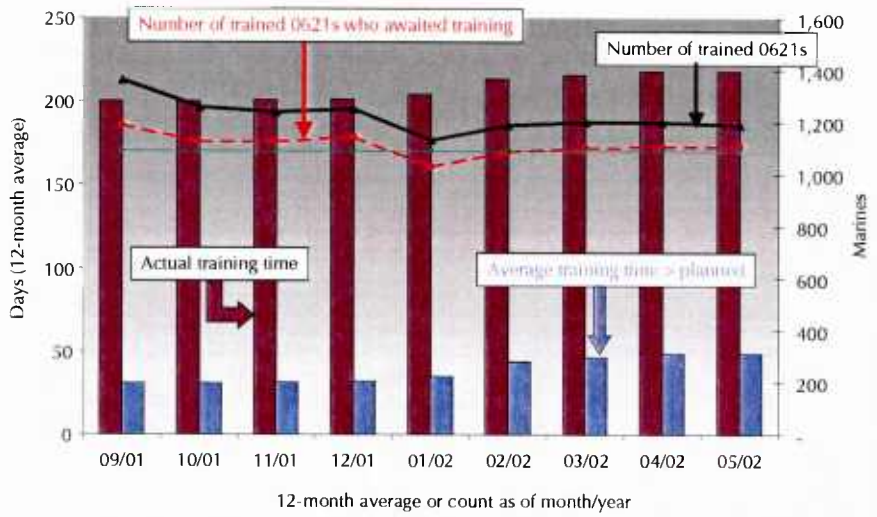
To get the aggregate number of days awaiting training, we simply add up the time awaiting training for all Marines in the PMOS. These calculations are also shown in the database as man-years of "time awaiting training. And, they can be calculated for all enlisted, for all officers, for all Marines, or by PMOS. As with the time-to-train variable, however, we suggest that a full year's data be used for any statistic. Thus, the database calculates everything as 12-month averages.

Figure 9 in the overarching indicators section of the paper showed the information that is displayed by the database for Riflemen, PMOS 0311. Let's look at three more PMOSs, using the figures displayed by the figures produced in the database. Figure 38 looks at PMOS 0621, figure 39 at PMOS 0302, and figure 40 at PMOS 7562. Both of the officer PMOSs show substantial time awaiting training. We suspect that the planned training time for officers is too short, but we were unable to obtain better data from TECOM in the course of this study.

In the overarching indicator section of the paper, we calculated the man-years spent awaiting training in the June 2001 to May 2001 period for officers and enlisted (977 and 4,716, respectively). Such numbers should be viewed with some caution because it is not clear how well-scrubbed the planned training times are. Tables 1 and 2 detail the information for enlisted personnel and officers.[29]

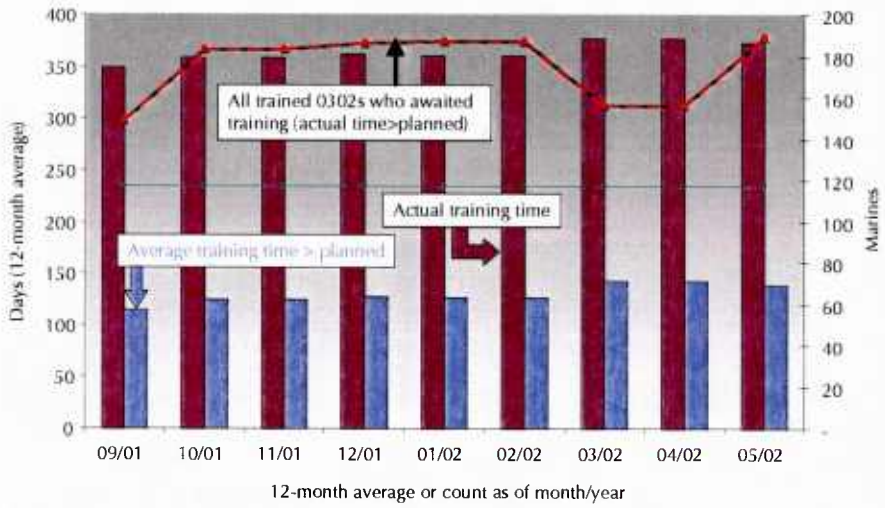
29. We analyzed enlisted personnel with accession dates from October 1999 and PMOS attainment dates from October 2000. We analyzed officers whose accession dates were from October 1997 and whose PMOS attainment dates were October 2000 or later. We may still be missing some officers whose training pipelines are very long (more than 4.5 years).

Figure 38. Time to train and time awaiting training: Field Radio Operator (0621)[a]



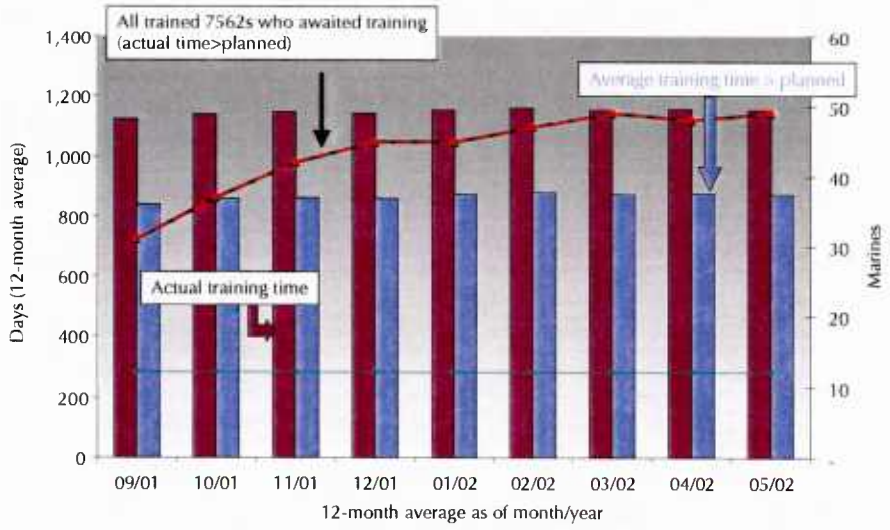
a. Note: Planned training time is 170 days (see green horizontal line).

Figure 39. Time to train and time awaiting training: Infantry Officer (0302)[a]



a. Note: Planned training time is 234 days (see green horizontal line).

Figure 40. Time to train and time awaiting training: Pilot HMH/M/L/A CH-46 (7562)[a]



a. Note: Planned training time is 283 days (see green horizontal line).

This database is new. To ensure that information is correct, schools must enter the "date of PMOS attainment" correctly and promptly into MCTFS. If the training is in non-Navy schools, it will be important to identify who should report the PMOS attainment data (if it is not currently being reported or not being reported promptly).

We have used this variable to build overarching indicators on the time to train and time awaiting training. Other indicators, however, could be built from the date of PMOS variable, and the variable could be used to answer the following types of questions:

- How many officers from the first TBS class in FY99 are still in the pipeline?
- How many FY00 accessions are still in initial skill training?
- What are the locations (MCC/RUCs) with large numbers of FY00 accessions that are still in the pipeline?

Table 1. Enlisted: Average time to train, planned time to train, and time awaiting training, June 2001 through May 2002[a]

PMOS	PMOS name	Number of Marines	Planned training (days)	Average training (days)	Awaiting training (days)[b]	Man-years awaiting training
0121	Personnel Clerk	716	149	193	44	86.3
0151	Administrative Clerk	745	144	192	48	97.6
0161	Postal Clerk	85	156	181	26	6.1
0231	Intelligence Specialist	160	205	270	65	28.4
0261	Geographic Intelligence Specialist	44	396	442	46	5.5
0311	Rifleman	3,375	152	172	35	323.3
0313	LAV Crewman	171	167	226	59	27.5
0321	Reconnaissance Man	84	206	422	218	50.0
0331	Machinegunner	608	152	179	42	70.3
0341	Mortarman	612	152	179	43	71.5
0351	Assault Man	414	152	174	37	41.9
0352	Anti-Tank/Assault Guided Missile	146	152	171	34	13.7
0411	Maintenance Management Specialist	182	141	209	68	34.0
0431	Log/Embark & Combat Support Specialist	166	146	211	65	29.7
0451	Air Delivery Specialist	38	212	274	62	6.5
0481	Landing Support Specialist	196	145	240	95	51.0
0511	MAGTF Planning Specialist	45	139	222	83	10.2
0612	Field Wireman	424	151	219	68	79.2
0613	Construction Wireman	21	252	308	72	4.2
0614	ULCS/Operator/Maintenaner	103	183	246	63	17.9
0621	Field Radio Operator	1,189	170	218	49	158.1
0622	Mobile Multichannel Equipment Operator	249	226	259	35	23.6
0624	High Frequency Comm Central Operator	8	0	273	[c]	0.0
0626	Fleet SATCOM Terminal Operator	6	238	366	139	2.3
0627	Ground Mobile Forces SATCOM Operator	35	253	308	55	5.3
0811	Field Artillery Cannoneer	465	146	189	43	54.8
0842	Field Artillery Radar Operator	25	178	226	48	3.3
0844	Field Artillery Fire Control Man	149	170	221	52	21.2
0847	Artillery Meteorological Man	19	186	207	22	1.1
0861	Fire Support Man	63	163	215	53	9.1
1141	Electrician	126	158	234	76	26.2
1142	Electronic Equipment Repair Specialist	159	194	288	95	41.3
1161	Refrigeration Mechanic	101	171	208	38	10.4
1171	Hygiene Equipment Operator	152	165	235	70	29.1
1181	Fabric Repair Specialist	21	166	225	65	3.7
1316	Metal Worker	68	211	259	48	8.9

Table 1. Enlisted: Average time to train, planned time to train, and time awaiting training, June 2001 through May 2002[a] (continued)

PMOS	PMOS name	Number of Marines	Planned training (days)	Average training (days)	Awaiting training (days)[b]	Man-years awaiting training
1341	Engineer Equipment Mechanic	284	173	200	27	21.1
1345	Engineer Equipment Operator	346	195	220	28	26.3
1361	Engineer Specialist	36	223	295	72	7.1
1371	Combat Engineer	580	153	202	49	78.2
1391	Bulk Fuel Specialist	288	165	200	36	28.2
1812	M1A1 Tank Crewman	102	170	236	66	18.4
1833	Assault Amphibious Vehicle Crewman	392	185	219	34	36.7
2111	Small Arms Repairer/Technician	278	180	237	58	44.0
2131	Towed Artillery Systems Technician	71	145	257	112	21.7
2141	Assault Amphibian Vehicle Repairer/Tech	139	219	279	60	22.9
2146	Main Battle Tank Repairer Technician	60	171	262	94	15.4
2147	Light Armored Vehicle (LAV) Repairer	91	184	229	46	11.4
2161	Repair Shop Machinist	30	189	258	69	5.6
2171	Electro-Optical Ordnance Repairer	103	237	327	90	25.3
2311	Ammunition Technician	277	159	191	33	24.7
2512	Field Wireman	30	0	196	[c]	0.0
2515	ULCS Operator/Maintainer	20	0	246	[c]	0.0
2531	Field Radio Operator	106	0	218	[c]	0.0
2621	Electronic Intelligence Intercept Operator/ Analyst	195	297	340	90	48.1
2631	ELINT Intercept Operator	29	215	260	63	5.0
2651	Special Intelligence System Admin/Comm	33	205	283	89	8.1
2671	Arabic Cryptologic Linguist	11	701	834	133	4.0
2674	Spanish Cryptologic Linguist	26	397	633	236	16.8
2676	Russian Cryptologic Linguist	13	569	736	167	6.0
2811	Telephone Technician	39	0	346	[c]	0.0
2818	Teletype and Tactical Office Machine Technician	27	0	348	[c]	0.0
2822	Electronic Switching Equipment Technician	37	216	328	112	11.4
2823	Technical Controller	5	0	441		0.0
2831	Microwave Equipment Repairman	37	286	443	157	15.9
2841	Ground Radio Repairer	250	0	381	[c]	0.0
2844	Ground Communication Organizational Repair	422	225	434	209	241.5
2846	Ground Radio Intermediate Repairer	314	255	441	186	159.8
2847	Telephone System/Personal Computer Immediate Repairer	235	313	489	176	113.5

Table 1. Enlisted: Average time to train, planned time to train, and time awaiting training, June 2001 through May 2002[a] (continued)

PMOS	PMOS name	Number of Marines	Planned training (days)	Average training (days)	Awaiting training (days)[b]	Man-years awaiting training
2848	Tact Remote Sensor Sys (TRSS) Maintainer	9	0	432		0.0
2871	Test Measurement and Diagnostic Equipment	22	251	378	127	7.6
2881	Communications Security Equipment Tech	102	254	372	118	33.0
2887	Counter Mortar Radar Repairer	18	279	323	75	3.7
3043	Supply Admin & Operations Clerk	703	151	185	34	64.7
3051	Warehouse Clerk	671	133	179	46	84.3
3052	Packaging Specialist	39	134	216	82	8.8
3112	Traffic Management Specialist	119	180	231	52	16.9
3381	Food Service Specialist	305	179	295	117	97.5
3432	Finance Technician	142	176	237	61	23.7
3451	Fiscal/Budget Technician	75	156	203	47	9.7
3521	Organizational Automotive Mechanic	752	205	310	106	217.4
3531	Motor Vehicle Operator	1,745	145	195	50	238.6
3533	Logistics Vehicle System Operator	446	167	237	70	85.6
4066	Small Computer Systems Specialist	714	0	246	[c]	0.0
4067	Programmer Ada	11	179	217	38	1.2
4341	Combat Correspondent	42	205	342	138	15.9
4421	Legal Services Specialist	84	165	232	67	15.4
4611	Combat Illustrator	2	214	178	6	0.0
4612	Combat Lithographer	16	226	290	64	2.8
4641	Combat Photographer	36	216	318	103	10.2
4671	Combat Videographer	17	222	304	82	3.8
5534	Musician Clarinet	10	271	314	50	1.4
5536	Musician Flute and Piccolo	17	271	278	31	1.4
5537	Musician Saxophone	14	271	301	40	1.5
5541	Musician Cornet or Trumpet	24	271	310	49	3.2
5543	Musician Baritone Horn/Euphonium	5	271	314	43	0.6
5544	Musician French Horn	7	271	327	56	1.1
5546	Musician Trombone	12	271	301	39	1.3
5547	Musician Tuba and String Bass/Elec	5	271	333	62	0.8
5563	Musician Percussion (Drums, Timpani)	8	271	308	58	1.3
5565	Musician Piano or Guitar	5	271	343	72	1.0
5711	Nuclear Biological and Chemical Defense Specialist	169	187	286	100	46.2
5811	Military Police	711	184	227	43	84.1
5831	Correctional Specialist	109	153	177	24	7.3

Table 1. Enlisted: Average time to train, planned time to train, and time awaiting training, June 2001 through May 2002[a] (continued)

PMOS	PMOS name	Number of Marines	Planned training (days)	Average training (days)	Awaiting training (days)[b]	Man-years awaiting training
5937	Aviation Radio Repairer	61	302	455	154	25.8
5942	Aviation Radar Repairer (AN/TPS-59)	49	397	539	142	19.1
5952	Air Traffic Control Navigational Aide Tech	24	377	472	95	6.3
5953	Air Traffic Control Radar Tech	25	490	613	123	8.4
5954	Air Traffic Control Communications	37	438	544	106	10.7
5962	Tactical Data Sys Equip (TDSE) Repairer	36	295	477	182	18.0
5963	Tact Air Operations Module Repairer	26	254	419	165	11.8
6011	Aircraft Mechanic-Trainee	27	0	199	[c]	0.0
6042	IMRL Asset Manager	83	175	249	87	19.7
6046	Aircraft Maintenance Admin Specialist	168	177	214	38	17.5
6048	Flight Equipment Technician	139	162	220	58	21.9
6051	Aircraft Hydraulic/Pneumatic Mechanic-Trainee	38	0	227	[c]	0.0
6062	Aircraft Inter Level Hydr/Pneu Mechanic	53	234	305	74	10.7
6071	Aircraft Maint GSE Mechanic-Trainee	87	0	284		0.0
6072	Aircraft Maint GSE Hydr/Pneu Structure Mechanic	93	344	407	67	17.1
6073	Aircraft Maint GSE Technician	51	341	399	60	8.4
6074	Cryogenic Equipment Operator	18	228	237	24	1.2
6081	Aircraft Safety Equipment Mechanic Trainee	6	0	211	[c]	0.0
6092	Aircraft Inter Level Structure Mechanic	63	190	257	67	11.6
6112	Helicopter Mech, CH-46	183	181	263	83	41.6
6113	Helicopter Mech, CH-53	127	181	237	56	19.4
6114	Helicopter Mech, U/AH-1	104	224	229	15	4.1
6122	Helicopter Power Plants Mech, T-58	29	195	242	47	3.8
6123	Helicopter Power Plants Mech, T-64	27	207	262	55	4.0
6124	Helicopter Power Plants Mech, T-53	34	226	261	37	3.5
6132	Helicopter Dynamics Component Mechanic	36	170	210	41	4.0
6151	Helicopter/Tiltrotor Air Mechanic	28	0	201	[c]	0.0
6152	Helicopter Airframe Mechanic CH-46	68	242	317	75	14.0
6153	Helicopter Airframe Mechanic CH-53	86	284	306	24	5.5
6154	Helicopter Airframe Mechanic A/UH-1	97	221	266	45	12.0
6172	Helicopter Crew Chief CH-46	72	334	448	115	22.6
6173	Helicopter Crew Chief CH-53A/D	49	287	406	121	16.2
6174	Helicopter Crew Chief UH-1	37	238	410	172	17.4
6211	Fixed Wing Aircraft Mech Trainee	38	0	197	[c]	0.0
6212	Fixed Wing Aircraft Mechanic AV-8/TAV-8	70	236	284	48	9.2

Table 1. Enlisted: Average time to train, planned time to train, and time awaiting training, June 2001 through May 2002[a] (continued)

PMOS	PMOS name	Number of Marines	Planned training (days)	Average training (days)	Awaiting training (days)[b]	Man-years awaiting training
6213	Fixed Wing Aircraft Mechanic EA-6	9	203	248	45	1.1
6214	Unmanned Aerial Vehicle (UAV) Mechanic	11	218	339	121	3.6
6216	Fixed Wing Aircraft Mechanic KC-130	24	226	299	73	4.8
6217	Fixed Wing Aircraft Mechanic F/A-18	87	202	226	24	5.8
6222	Fixed Wing Aircraft Power Plants F-402	25	277	321	44	3.0
6223	Fixed Wing Aircraft Power Plants J-52	10	192	222	30	0.8
6226	Fixed-Wing Air Power Plant Mechanic T-56	15	211	251	40	1.6
6227	Fixed-Wing Air Power Plant Mechanic F-404	25	200	245	46	3.1
6232	Fixed-Wing Airflight Mechanic KC-130	30	347	458	119	9.7
6251	Fixed Wing Airframe Mechanic Trainee	52	0	217	[c]	0.0
6252	Fixed Wing Airframe Mechanic AV-8/TAV	63	243	313	72	12.4
6253	Fixed Wing Airframe Mechanic EA-6	18	187	257	70	3.5
6256	Fixed Wing Airframe Mechanic KC-130	43	241	305	64	7.6
6257	Fixed Wing Airframe Mechanic F/A-18	64	208	274	68	11.9
6281	Fixed Wing Airsafety Equip Mechanic Trainee	6	0	197	[c]	0.0
6282	Fixed Wing Aircraft Safety Equip Mech AV-8	24	231	310	79	5.2
6283	Fixed Wing Aircraft Safety Equip Mech EA-6	7	210	246	36	0.7
6286	Fixed Wing Acft Safety Equip Mech KC-130	12	225	283	58	1.9
6287	Fixed Wing Acft Safety Equip Mech F/A 18	27	205	276	71	5.2
6312	Aircomm/Nav/Elec/Wpns Systems Tech AV-8	27	327	399	76	5.6
6313	Aircomm Navrdr Systems Technician EA-6	13	270	382	112	4.0
6314	UAV Avionics Technician	6	336	511	175	2.9
6316	Aircomm Navsys Technican KC-130	12	290	383	93	3.1
6317	Aircomm Navwpns Systems Tech F/A-18	60	307	425	118	19.4
6322	Aircomm Navelec Systems Tech CH-46	63	311	437	126	21.7
6323	Aircomm Navelec Systems Tech CH-53	97	332	453	122	32.5
6324	Aircomm Navelecwpns Systems Tech U/AH-1	80	320	465	149	32.6
6331	Aircraft Electrical Systems Tech - Trainee	18	0	352	[c]	0.0
6332	Aircraft Electrical Systems Tech AA-8	35	346	431	85	8.1
6333	Airelec Systems Tech EA-6	16	301	415	114	5.0
6336	Airelec Systems Tech KC-130	25	331	425	94	6.4
6337	Aircraft Electrical Systems Tech F/A-18	46	298	415	117	14.7
6386	Aircraft Electronic Countermeasures Tech, EA-6B	8	264	345	81	1.8
6412	Aircraft Communications Systems Tech	58	347	487	144	22.9
6413	Aircraft Navigation Systems Technician	97	340	465	125	33.2

Table 1. Enlisted: Average time to train, planned time to train, and time awaiting training, June 2001 through May 2002[a] (continued)

PMOS	PMOS name	Number of Marines	Planned training (days)	Average training (days)	Awaiting training (days)[b]	Man-years awaiting training
6423	Aviation Electronics Micro-Miniature Repair (IMA)	33	277	379	102	9.3
6432	Aircraft Electrical/Instrument/Flight Tech, IMA	28	280	377	97	7.4
6433	Aircraft Elec/Instrument/Flight Contro	41	315	487	172	19.3
6461	Hybrid Test Set Tech IMA	22	340	490	150	9.0
6462	Avionics Test Set (ATS) Technician	20	318	482	164	9.0
6463	Radar Test Station/Radar System Tech	8	340	469	129	2.8
6464	Airport Inertial Navigation System	17	319	466	147	6.9
6466	Acft Forward Looking Infrared/	22	361	478	117	7.0
6467	Cass Tech IMA	27	368	508	140	10.4
6468	Aircraft Electrical Equip Test Set	12	0	460	[c]	0.0
6482	Acft Electronics Countermeasures	19	361	498	137	7.1
6483	Acft Electronic Countermeasures	31	350	501	151	12.8
6484	Airelecctrsys Radcom/Cat	28	357	470	113	8.7
6492	Avn Pme Calb Repair Tech	89	377	536	159	38.8
6494	ALTIS Specialist	34	0	442	[c]	0.0
6531	Aircraft Ordnance Technician	239	197.8	272	75	48.8
6541	Aviation Ordnance Systems Tech	204	240	298	58	32.5
6672	Aviation Supply Clerk	251	180	206	29	19.7
6694	Aviation Info Sys Spec	74	329	547	218	44.1
6821	Weather Observer	57	198	284	86	13.4
7011	ESPED Air Sys Tech	58	161	235	74	11.7
7041	Aviation Operations Specialist	133	179	234	55	20.1
7051	Acft Firefighting & Rescue Specialist	255	226	281	57	39.9
7212	LADD Gunner	116	234	270	40	12.8
7234	Air Command And Control Electronic	35	203	310	107	10.2
7242	Air Support Operations Operator	41	171	272	101	11.4
7251	Air Traffic Control Trainee	407	0	225	[c]	0.0
7257	Air Traffic Controller	52	226	548	322	45.9
7314	UAV Air Vehicle Operator	23	175	160	20	1.2
7371	Aerial Navigator-Trainee	7	0	419	[c]	0.0
7372	First Navigator	7	493	664	171	3.3
7381	Airborne Radio Operator/Loadmaster (Trainee)	12	0	369	[c]	0.0
7382	Airborne Radio Operator/Loadmaster	8	434	641	207	4.5

a. PMOSs with less than 5 Marines trained in the year period are omitted from the table.
b. Time awaiting training is counted only if it is positive. The average, however, is for all Marines trained in the period.
c. Planned training is not available for this PMOS, therefore we cannot calculate time awaiting training.

Table 2. Officers: Average time to train, planned time to train, and time awaiting training (June 2001 through May 2002)

PMOS	PMOS name	Number of officers	Planned training (days)	Average training (days)[a]	Average awaiting training (days)	Overall man-years awaiting training
0180	Adjutant	31	207	372	166	14.1
0202	Intelligence Officer	12	254	730	476	15.6
0203	Ground Intelligence Officer	18	328	487	159	7.8
0204	Human Intellligence Officer	7	264	697	433	8.3
0206	Signal Intelligence Officer	5	313	359	52	0.7
0207	Air Intelligence Officer	17	304	564	260	12.1
0302	Infantry Officer	189	234	373	139	71.8
0402	Logistics Officer	114	227	415	188	58.8
0602	Communications Officer	52	334	543	209	29.8
0802	Field Artillery Officer	87	305	412	109	25.9
1302	Engineer Officer	38	256	463	207	21.6
1802	Tank Officer	10	280	377	107	2.9
1803	Assault Amphibious Vehicle Officer	2	242	305	63	0.3
3002	Ground Supply Officer	50	252	455	208	28.5
3404	Financial Management Officer	20	207	639	432	23.6
4302	Public Affairs Officer	6	226	314	88	1.4
4402	Judge Advocate	49	236	358	126	16.9
4430	Legal Admin Officer	1	208	339	131	0.4
5803	Military Police Officer	15	231	387	156	6.4
6002	Aircraft Maintenance Officer	22	239	412	175	10.5
6602	Aviation Supply Officer	19	265	550	289	15.0
7204	Surface-to-Air Weapons Officer	29	208	848	640	50.8
7208	Air Support Control Officer	22	215	527	312	18.8
7210	Air Defense Control Officer	18	248	544	296	14.6
7220	Oa-4M Fac(A)/Tac(A)	11	271	580	309	9.3
7507	FRS Basic AV-8B Pilot	30	0	1,187		
7509	Pilot VMA-AV-8B	11	392	1,366	974	29.3
7521	FRS Basic F/A-18 Pilot	14	0	1,124		
7523	Pilot VMFA F/A-18	16	413	1,511	1,098	48.1
7524	FRS Basic F/A-18D	15	0	871		
7525	F/A-18D Basic	16	364	1,243	879	38.5
7541	FRS Basic EA-63 Pilot	10	0	1,133		
7556	FRS KC-130 Copilot	30	374	909	535	44.0
7558	FRS Basic CH-53D Pilot	12	0	1,010		
7560	FRS Basic CH-53E Pilot	34	0	969		

Table 2. Officers: Average time to train, planned time to train, and time awaiting training (June 2001 through May 2002) (continued)

PMOS	PMOS name	Number of officers	Planned training (days)	Average training (days)[a]	Average awaiting training (days)	Overall man-years awaiting training
7561	FRS Basic CH-46 Pilot	56	0	940		
7562	Pilot HMH/M/L/A CH-46	49	283	1,155	872	116.9
7563	UH-1N Qualified	20	311	1,178	867	47.5
7564	CH-53 A/D Qualified	13	297	1,225	928	33.0
7565	Pilot HMH/M/L/A AH-1	31	311	1,163	852	72.3
7566	Pilot CH-3E	27	276	1,172	896	66.3
7567	FRS Basic UH-1N Pilot	27	0	984		
7568	FRS Basic AH-1 Pilot	41	0	931		
7582	FRS Basic EA-6B Electronic Warfare	14	0	863		
7588	Qualified EA-63 Electronic Warfare	7	482	1,256	774	14.8
7598	Fixed Wing Flight Student	57	0	613		

a. Time awaiting training is only counted if it is positive. The average, however, is for all Marines who obtained the PMOS in the period.

Indicator of the current and future aviator inventory

We have developed an aviator inventory indicator because of ongoing aviator retention concerns and the lengthy training time required before new aviators arrive in the fleet. We interviewed appropriate action officers and identified their current indicators, the pertinent data sources, and the processes they support. One piece of missing data—the date an individual aviator's obligation ends—is preventing the Marine Corps from a full and accurate determination of the germane characteristics of the current and future inventory.

The Deputy Commandant for Aviation (DC A) and the Deputy Commandant for Manpower and Reserve Affairs (DC M&RA) have recurring concerns with current and future aviator inventories, as evidenced by frequent and varied information requests concerning pilot retention, aviator time-to-train, aviator resignations, and bonus program (Aviation Continuation Pay (ACP)) assessments. Historically, these measures have characterized the aviator inventory. Because they have been presented so frequently, everyone involved with aviation manpower issues assumes they are valid indicators. Therefore, we have taken a fresh look at their value as indicators.

Background

We interviewed three action officers in researching the background for this subject. The officer responsible for advocating the structure of aviation manning is the Aviation Manpower Integration Officer, in the ASM Division. The officer responsible for developing, implementing, and maintaining manpower plans and programs for aviation officers is the Aviation Officer Inventory Planner (MPP-33), in the MP Division at M&RA. The officer responsible for administering the creation of new fields and data elements in the Marine Corps

Total Force System (MCTFS) is the head of the Manpower Information Field Support Branch.

The three portions of the aviation manpower process are structure, training, and manpower. The Total Force Structure Division of MCCDC owns the structure portion of the process, the Training Command of TECOM owns the training portion of the process, and M&RA owns the manpower portion of the process. HQMC Aviation is the advocate for the entire aviation manpower process, but does not control any of its processes. The Aviation Manpower Integration Officer is the aviation advocate to manpower for the planning and retention of aviation officers. He is not involved in the recruiting portion of the aviation manpower process.

DC A, fulfilling his role as the Marine Corps advocate for aviation, frequently tasks ASM to advise him on the status of aviation officer manpower. The Aviation Manpower Integration Officer is the action officer that accomplishes this tasking. DC M&RA tasks MP to advise him of any impending concerns with the status of aviation officer manpower. The Aviation Officer Inventory Planner is the action officer that accomplishes this tasking.

The question

The status of aviation manpower is the answer to the question:

> "Is the current Aviation Officer Inventory sufficient, and properly distributed so that the Marine Corps can meet manning and training requirements today and in the future?"

The data we found, presented in their current form, cannot be used to directly, or indirectly, answer that question. We will describe the distribution of the aviation officer inventory, the current indicators used to evaluate that distribution, the data that support those indicators, and the shortfalls of those indicators and data. Then we will propose a single enhanced indicator and the critical data needed to support it.

The distribution of the aviation officer inventory

We can better understand the aviator inventory distribution, including its data sources and processes, by viewing it from different perspectives. First we describe an individual aviator's progression through his career, which correlates to, and is diagramed as, a process flow (see figure 41). Then we describe some of the ways to partition the inventory into mutually exclusive sets, to demonstrate how different information is available depending on how the inventory is divided. A point to remember is that in the grand scheme, the number of qualified aviators is the issue of concern. Trainees are only important because they are potential, future, qualified aviators.

Figure 41. Process flow of the aviator inventory (also the career progression of an individual aviator)

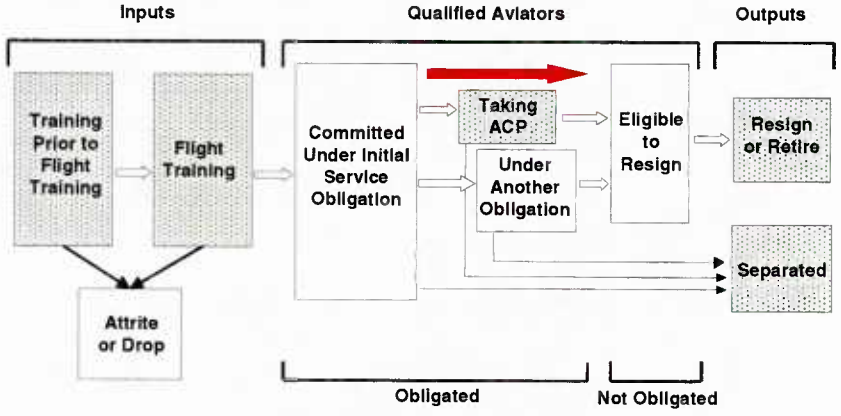


Figure 41 displays the aviator inventory's process flow perspective, which is analogous to an individual aviator's progression through his career. Starting at the left, officers enter the process as Aviators in Training (we mean here training prior to becoming winged), first at The Basic School (TBS) and then at Undergraduate Flight Training (UFT). As Aviators in Training, these officers may attrite from training or opt to discontinue their training, in which case they never enter the qualified aviator inventory. Successful graduates of UFT are winged and do enter the qualified aviator inventory, incurring an Initial Service Obligation (ISO). Once qualified aviators have satisfied

their ISO, they have the option to re-obligate, either by taking Aviation Continuation Pay (ACP or "The Bonus"), or incurring another commitment (SEP, ADP, taking TA, PCS, etc.). Aviators who re-obligate must remain on active duty, while those who do not may resign their commission. Qualified aviators, regardless of obligation status, may be passed over for promotion and subsequently forced out of the Marine Corps, thereby leaving the qualified aviator inventory.

From a process flow perspective, inventory inputs are successful UFT graduates, and inventory outputs are aviators who voluntarily resign or are forcibly separated.

Notable items in figure 41 are the shaded boxes and arrow. The shaded boxes represent pools about which the Marine Corps maintains good, systemic data. The shaded arrow emanating from "Committed Under Initial Service Obligation" and terminating at "Eligible to Resign or Retire" represents officers who satisfy their initial service obligation and remain eligible for resignation by not incurring another commitment. This critical process flow cannot be analyzed effectively because the Marine Corps lacks good data on the adjacent groups.

We define the following terms to discuss the qualified aviator inventory:

QualAvi(t) = the total number of qualified aviators at time t

Oblig(t) = the total number of aviators, at time t, who are obligated to remain on active duty

ISO(t) = the total number of aviators, at time t, who will be under their initial service obligation (ISO)

ACP(t) = the total number of aviators, at time t, who will be under an obligation for taking ACP

OTH(t) = the total number of aviators, at time t, who will be under some obligation other than ISO or ACP

EligRes(t) = the total number of aviators, at time t, who are eligible to resign or retire, because they are not under any obligation.

Then, the inventory of qualified aviators at time t is:

$$\text{QualAvi}(t) = \text{Oblig}(t) + \text{EligRes}(t), \text{ where} \quad (1)$$

$$\text{Oblig}(t) = \text{ISO}(t) + \text{ACP}(t) + \text{OTH}(t), \text{ so} \quad (2)$$

$$\text{QualAvi}(t) = \text{ISO}(t) + \text{ACP}(t) + \text{OTH}(t) + \text{EligRes}(t). \quad (3)$$

EligRes(t), the basis for estimating potential inventory outflows, is calculated from:

$$\text{EligRes}(t) = \text{QualAvi}(t) - (\text{ISO}(t) + \text{ACP}(t) + \text{OTH}(t)). \quad (4)$$

Of the four values required to calculate EligRes(t), we accurately know two: number of qualified aviators and number of aviators on ACP.[30] The Marine Corps cannot distinguish between ISO(t) and EligRes(t), so determining the number of officers eligible to resign—the basis for estimating inventory outflows—is extremely difficult.

Different ways to partition the inventory

Partitioning the entire aviator inventory reveals different information about the qualified aviator distribution. Dividing the overall aviator inventory based on aviator qualification results in the two mutually exclusive groups, Aviators in Training and Winged Aviators (first panel, figure 42). Aviators in Training include those designated officers at TBS, and those awaiting or progressing through UFT. This division provides a measure of potential input to the inventory of qualified aviators, and can be evaluated with a TFDW query.

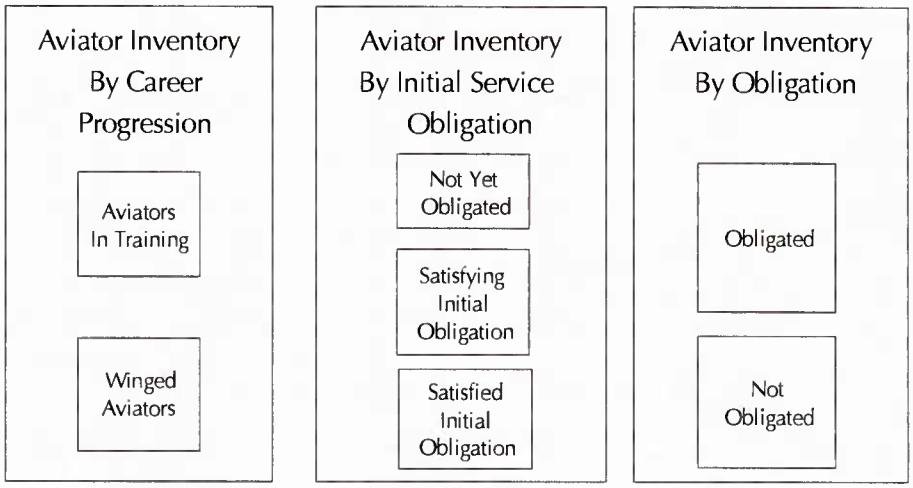
We can also divide aviators into three sets based on their status with regard to their Initial Service Obligation (ISO) (second panel of figure 42). The three sets are those who have not yet incurred the obligation (Aviators in Training), those who are currently satisfying the obligation, and those who have already satisfied the obligation.[31]

30. We could identify the inventory of qualified aviators by pulling them from the total force data warehouse (TFDW).

31. Aviators in Training are officers who are required to remain on active duty for a certain length of time, and are therefore "committed." As far as the aviation community is concerned, however, they will not have an aviation obligation until they complete UFT. It makes sense to categorize them as not having an obligation because, if they attrite from training or quit, they never become qualified, winged aviators.

Unfortunately, the Marine Corps cannot use the manpower information systems to partition the inventory this way because aviators' ISO ending date is not explicitly captured in the MCTFS.

Figure 42. Three methods to partition the aviator inventory



After satisfying the ISO for UFT, aviators may incur follow-on obligations for other reasons: taking ACP, executing a PCS, attending a school program, and so forth. Therefore, we can divide all aviators into two mutually exclusive groups based on their obligation status. One group includes aviators under an obligation (initial or follow-on), and the other group includes aviators not obligated (Aviators in Training, and those who have satisfied their ISO but have not incurred a follow-on obligation) (third panel, figure 42). This division adds the dimension of certainty to the inventory characterization. The Marine Corps is guaranteed[32] of having obligated, qualified aviators on active duty for the term of their obligation. The Marine Corps is uncertain of how long nonobligated aviators will fulfill manning requirements.

32. Nothing is guaranteed because there will always be random events, such as untimely deaths, and disqualifications. However, the Marine Corps is relatively certain that obligated aviators will remain on active duty throughout the term of their obligation.

Some of these nonobligated are Aviators in Training who are undergoing either Training Prior to Flight Training or UFT. This process is well understood, monitored, and controlled by the Officer Inventory Planner (MPP), Aviation Officer Inventory Planner (MPP-33), and the Aviation Manpower Integration Officer (ASM). Much effort has been expended in understanding and measuring the numerous issues surrounding the training of aviators. We don't feel this study can make significant improvements in this part of the overall process. Instead, we've chosen to focus exclusively on the current and future qualified aviator inventory.

Qualified aviators

If we take the Aviators in Training out of the nonobligated group, we can identify the population of concern—qualified aviators. We believe this last partition of the aviator inventory (third panel of figure 42—qualified aviators only, no Aviators in Training) provides the necessary information to accurately determine the current status, and reasonably forecast the future state, of the aviator inventory. Current inventory is calculated as:

$$\text{QualAvi}(\text{today}) = \text{Oblig}(\text{today}) + \text{EligRes}(\text{today}). \quad (5)$$

Forecasting future inventories at time t requires estimates of Oblig(t) and EligRes(t):

$$\text{QualAvi}(t) = \text{Oblig}(t) + \text{EligRes}(t), \quad (6)$$

where Oblig(t) is the sum of two numbers, the number of aviators whose current obligation extends through or beyond time t, and the number of aviators who are not currently obligated through time t, but we estimate will be so in the future. So future inventories can be calculated as the sum of known and estimated aviators at the future time t, where

$$\text{QualAvi}(t) = \text{Known}(t) + \text{Estimate}(t), \text{ where} \quad (7)$$

Known(t) = sum of aviators today who are obligated through or beyond time t in the future, and

Estimate(t) = those aviators not currently obligated through time t in the future that we estimate will be available at time t.

Obligations

The two aviation-specific obligations that aviators incur are for UFT and for taking ACP payments. All aviation officers incur an initial service obligation when they are awarded wings on completion of undergraduate flight training (UFT). This obligation is often described as "X years after wings," where the value of X varies depending on the community the aviator is winged into (rotary-wing pilots, maritime (C-130) pilots, tactical jet pilots, and NFOs). Before FY91 (October 1990), this initial service obligation was not codified in law, but was a matter of individual service policy. In fact, individuals' commitments within the USMC fixed-wing community varied between 4½ and 6 years depending on how their contracts were written. For contracts signed in FY91 and after, Title X specifies that the initial obligation for strike pilots is 8 years after wings, and for helicopter and maritime pilots and NFOs is 6 years after wings [Title X, Chapter 37, Sec 653].

The second aviator-specific obligation comes from accepting bonus money. Aviation Continuation Pay (ACP) is a monetary bonus program intended "to provide a proactive long-term aviation career incentive for marine aviation field grade officers. [Maradmin 545/01]." Qualified officers apply to receive the bonus money and, on approval, agree "to accept a short-term officer service obligation [Maradmin 545/01]." There are different bonus options, where the length of the commitment increases with the amount of the bonus. Qualifying criteria can vary from year to year, allowing planners to tailor the bonus to current and projected needs. The major variables are specific MOSs (which correspond to crews of different aircraft), the amount of the bonus, and the length of the incurred obligation. The statutory requirement for ACP eligibility is that the applicant must have satisfied the initial service obligation incurred as the result of completing UFT [Title X, Chapter 37, Sec 653].

Like all officers, aviators are subject to PCS and promotion obligations. We distinguish them from aviation-specific obligations by referring to these service obligations, along with others, as "other obligations." The capability to capture some of these data exists,

although it is not being exploited. During our interview with the head of the Manpower Information Field Support Branch, we found an MCTFS transaction code that updates a data field entitled "Training/ School Obligation Date (TTC 060)." The code has a one-character training school obligation code, followed by an eight-character termination of obligation date. This transaction "establishes the termination date (pay-back-date) of military obligation associated with personnel who participated in Marine Corps-sponsored education or training in excess of 20 weeks. The termination date is determined from the graduation date or training completion date and the length of obligation incurred with specific programs [MCTFSPRIM]." This code, if used, would enable a more complete and accurate description of the inventory distribution by capturing at least some of aviators' other obligations.

Obtaining accurate ending date of commitment

We have mentioned that the ending date of an individual's initial service obligation is not directly recorded in MCTFS. Theoretically, it could be calculated using an aviator's winging date, his community, and the policy in force at that time, but there would still be problems. The winging date (Pilot Designation Effective Date (PDD)) field is not populated for a large portion of the aviation officer population. Also, the policy regarding length of obligation is the policy in force when the contract was signed, which could precede the winging date up to 7 years (assuming signing a contract when starting college, 4 years to graduate college, 1 year for TBS and delays waiting for flight training, and 2 years for tactical jet training). The standardizing effects of FY91 changes to Title X will eventually eliminate the confounding variability of commitment lengths, but ending dates of obligations will still need to be calculated, and PDDs will have to be back-filled.

The Aviation Officer Inventory Planner (AOIP) and the Assistant LtCol's Aviation Monitor, in conjunction with personnel from MI Division, drafted a new MCTFS code and associated business rules to capture these data in the MCTFS system. The new transaction, the "Incurred Service Obligated Date," will incorporate all relevant and necessary data to track both initial service and ACP obligations.

Because of these Marines' expedient action, the Marine Corps should be able to start collecting this information during FY03.

Current indicators

Three indicators are used to characterize the state of aviation manpower in each of the three aviation communities (rotary-wing, fixed-wing, and NFO):

- Current inventories
- Fixed-wing resignations
- Aviation Continuation Pay (ACP) "take-rates."

The Aviation Manpower Integration Officer and the Aviation Officer Inventory Planner, through their experience, use these measures to interpret and qualitatively assess the health of aviation officer manpower.

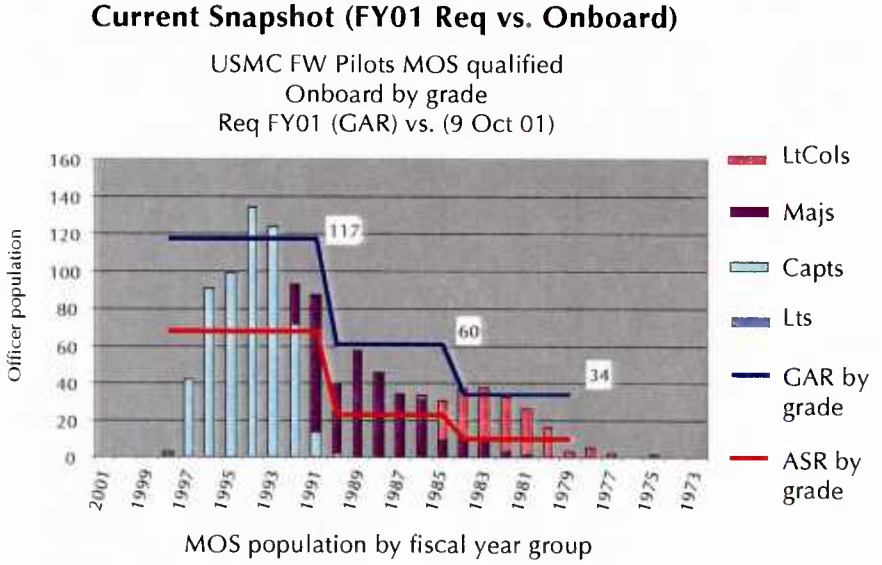
Current and future inventories

Separate inventories are presented for each community, where counts are further partitioned into year-group cohorts, and compared to both the ASR and the GAR. These charts give a snapshot of the Marine Corps' ability to meet requirements today. An example of the fixed-wing pilot inventory is shown in figure 43.

The ASR and GAR requirements are shown as horizontal straight lines, corresponding to a number of pilots, spanning a number of year-group cohorts. The overall requirement of the ASR or GAR is equal to the corresponding number of pilots, times the number of year-group cohorts the line spans. For example, the overall GAR requirement for Majors is 360. The chart shows the GAR requirement for Majors as a line at 60 which spans 6 year-group cohorts (1985-1990). This representation equates to 360 Majors (6*60=360). These inventories require interpretation because shortfalls in any particular year-group cohort are not necessarily an issue if they can be balanced by overages in adjacent year-group cohorts. Inventories exceeding the ASR suggest that the aggregate number of officers of a particular grade exist to fill all required T/Os for that community.

Inventories exceeding the GAR suggest that the aggregate number of officers of a particular grade exist to account for all P2T2, and to fill all required T/Os and apportioned B-Billets for that community. Information pulled from MCTFS utilizing TFDW is used to create these graphs.

Figure 43. Example of current indicator—fixed-wing pilot inventory



These raw inventories provide little information to forecast the ability to meet future needs. The inventory distribution over time needs to be described to enable forecasting. The distribution would be composed of two portions:

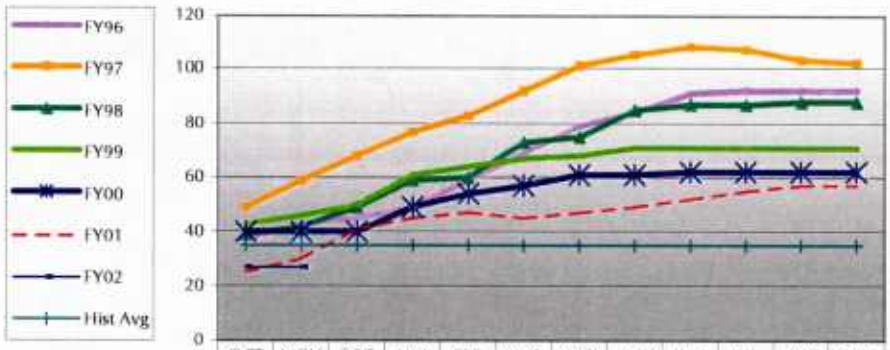
- Current inventories that can be counted
- Future forecast inventories, including
  - — A known, countable portion (today's aviators that are guaranteed to still be available at the future time)
  - — A probabilistic portion (today's aviators that might still be available at the future time, and those officers who are not aviators today, but might be at the future time).

The farther forward in time the forecast, the smaller the known portion, and the greater the unknown portion. Without an automated record of when individual aviators' ISOs will be complete, this distribution cannot be created.

Planned resignations

The next indicator being used is the planned resignations of fixed-wing pilots and NFOs. Officers must have fulfilled all service obligations to be eligible to resign. The planned resignations of fixed-wing pilots and NFOs (figure 44) are counted cumulatively for each fiscal year.

Figure 44. Example of current indicator—cumulative planned fixed-wing pilot and NFO resignations



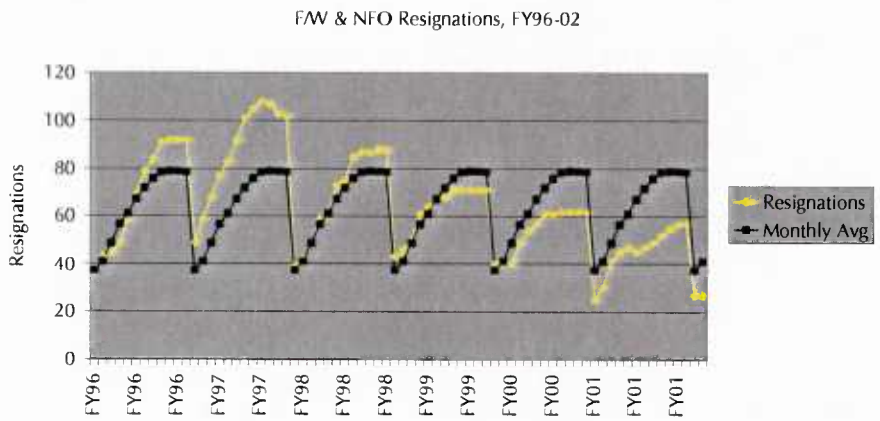
	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP
FY96	37	43	45	49	59	69	79	84	91	92	92	92
FY97	49	59	68	77	83	92	101	105	108	107	103	102
FY98	39	42	49	59	60	73	75	85	87	87	88	88
FY99	43	46	50	61	64	67	68	71	71	71	71	71
FY00	40	40	40	49	54	57	61	61	62	62	62	62
FY01	25	30	41	45	47	45	47	49	52	55	57	57
FY02	27	27										
Hist Avg	35	35	35	35	35	35	35	35	35	35	35	35

For example, all aviation officers' approved resignations, which become effective during FY02, are counted in the FY02 planned resignations. Because these are cumulative, the count starts at 1 October and does not decrease until September 30 the following calendar year. These planned resignations are reported as an absolute number instead of as a percentage of those eligible to resign because there are

no automated records of when an individual aviator's initial service obligation ends. These planned resignations are being used mainly for trend detection.

Figure 45 displays the same information in a different format. Here, we calculated a monthly average of cumulative resignations over the period FY96-02. This is plotted as the dark line in figure 45; notice that it is the same curve repeated each fiscal year. The light line represents actual cumulative planned resignations; of course, they vary from fiscal year to fiscal year.

Figure 45. Cumulative planned resignations for fixed-wing pilots and NFOs



We think that this alternative presentation displays the issue of concern more clearly. Figure 45 plainly shows variations from the norm, and overall trend. Note that FY96 and FY97 show a definite increase in the cumulative number of planned resignations. The overall trend since FY98 has been a decrease in the number of planned resignations. Although this decreasing trend in planned resignations looks good, we must point out that the effect of Title X changes in the length of initial service obligation described above are occurring over a number of years. The majority of aviators whose obligations were not governed by Title X had satisfied their initial obligation by FY98-99. Even the earliest fixed-wing pilots covered under Title X

would not be eligible to resign because of the extended commitment until December 2001. Therefore, recent historical data need to be viewed in light of this policy change context.

Unfortunately, planned resignations as absolute numbers are insufficient to identify trends in resignation rates. For example, if the number of resignations goes down, but the number of officers eligible to resign has decreased at a greater rate, the resignation rate (measured as the number of resignations divided by the number of those eligible to resign) will actually have risen. Consequently, we recommend using planned resignations, as a percentage of those eligible, to estimate future outflows from that group of aviators identified as eligible to resign. Implementing this recommendation requires capturing the end-of-initial-service-obligation data, described earlier, to accurately count the number of officers eligible to resign.

ACP "take-rates"

Aviation manpower planners use ACP take-rates to get trend information for future inventories. There is no way to know how many officers are still under their initial service obligation, so there is no reasonable method to accurately count the number of aviation officers eligible for ACP. As a result, the ACP take-rates are approximate, based on estimates of the number of eligible officers. If the above-mentioned initial service obligation ending date issue is resolved, aviation manpower planners could then get accurate take-rates because they will know the number of eligible officers. Also, because the Aviation Officer Inventory Planner can retrieve the ending date of aviators' ACP obligations through MCTFS, he will accurately know the number of aviators guaranteed to be on active duty at any point in the future.

Closing comment

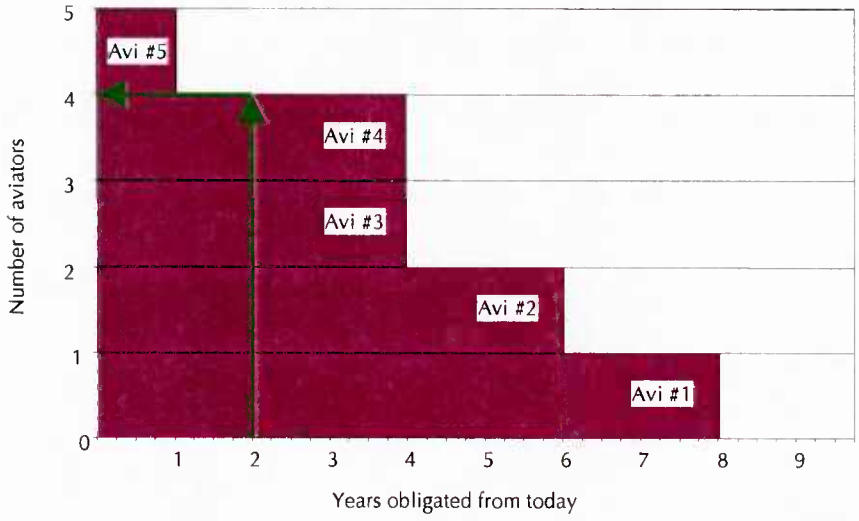
Currently, aviation manpower planners analyze the foregoing three categories of information, attempting to derive an indication of the health of aviation officer manpower. It is clear that these pieces of information are insufficient and that forecasting, as well as our understanding of the health of aviation inventories, will be significantly improved by recording aviators' end of obligation date in MCTFS.

Aviator inventory indicators

Indicator concept

We illustrate here how to exploit obligation ending date information to better characterize aviator inventories. The inventory of a hypothetical aviator community consisting of five aviators, each with an 8-year obligation incurred at winging, is displayed in figure 46. The horizontal axis displays years obligated from today.

Figure 46. Aviator inventory forecasting concept



The vertical axis in figure 46 represents the total number of aviators obligated. The newest addition to the community (Avi #1) was just winged today, so he will be obligated to remain on active duty for 8 years from today. Another aviator (Avi #2) was winged 2 years ago, which means he is obligated though 6 years from today. Two aviators (Avi #3, #4) were winged 4 years ago, so they both owe 4 more years, and the most senior aviator (Avi #5) was winged 7 years ago and owes 1 more year.

To show how to use this chart, we ask, "How many aviators in this community today are guaranteed to still be in this community 2 years from now?" We find 2 years from today on the horizontal axis, read up to

the top of the chart, read left, and see there are 4 aviators on the vertical axis. This interpretation specifies this community's current inventory distribution over time.

Current inventories

With this concept in mind, we suggest presenting inventory information in like fashion. Figures 47 and 48 are for explanatory purposes, and figure 49 is our complete current inventory presentation. The ISO obligation data are not yet available, so we used September 2001 HMF file data and a basic algorithm to generate notional, working data. We combined this with ACP data, current and accurate as of January 2002. The following charts are produced as a proof of concept for our aviator inventory indicator, and should in no way be used as a basis for drawing any conclusions about the AV-8B community.

All figures show the number of winged AV-8B pilots (MOS 7507 and 7509) obligated to remain on active duty for a specified number of years in the future. Just as in our hypothetical community example, the horizontal axis displays years obligated from today, and the vertical axis displays the total number of obligated aviators.

Figure 47 displays those AV-8B pilots (notional) under their initial service obligation (ISO) and the length of those obligations. Interpretation is the same as in the hypothetical community example. For example, we can forecast the number of aviators currently under their ISO, who will still be under their ISO in 3 years. We find 3 years from today along the horizontal axis, read up and left to the vertical axis, and see that 150 aviators are guaranteed to still be under their ISO 3 years from today. Note that this displays only current known data, not future estimates.

Figure 48 displays those AV-8B pilots (notional) under an obligation for receiving ACP. It is interpreted in the same manner as figure 47. For example, 21 aviators are currently obligated through the next 3 years according to their ACP contract. Again, figure 48 displays only current known data, not future estimates.

Figure 47. AV-8B pilots under ISO

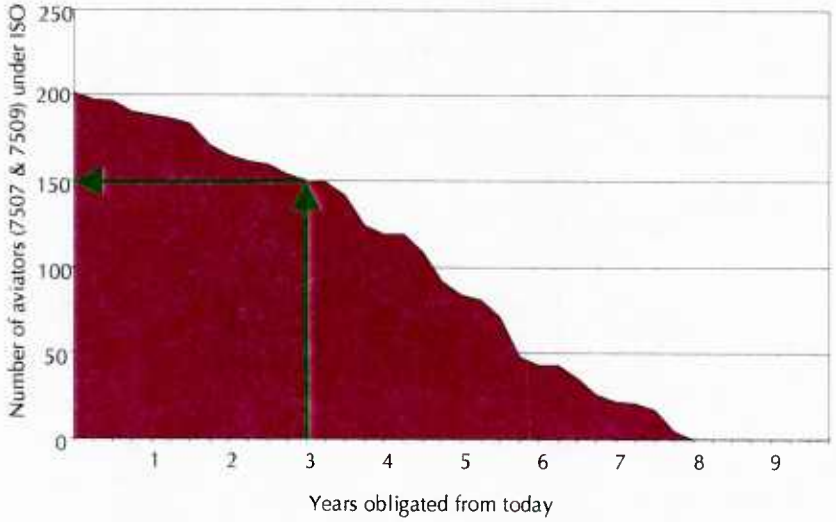
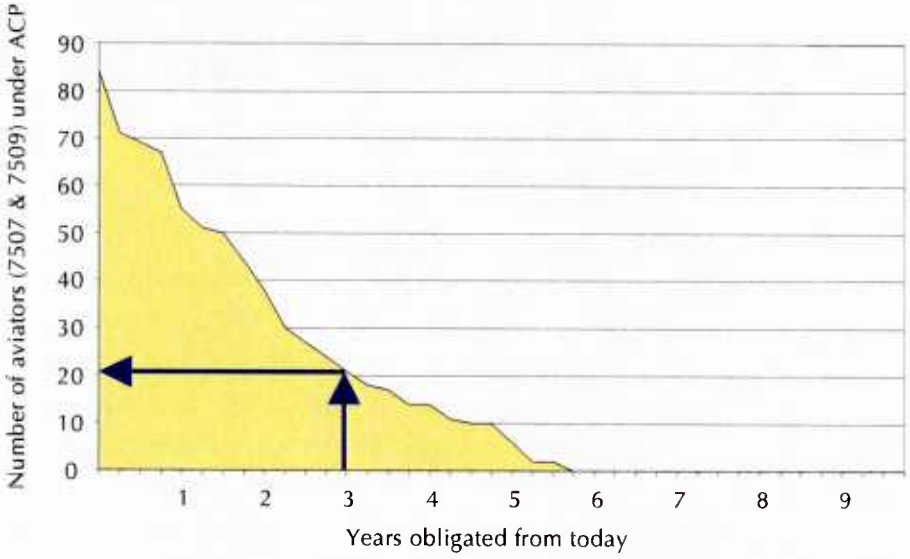


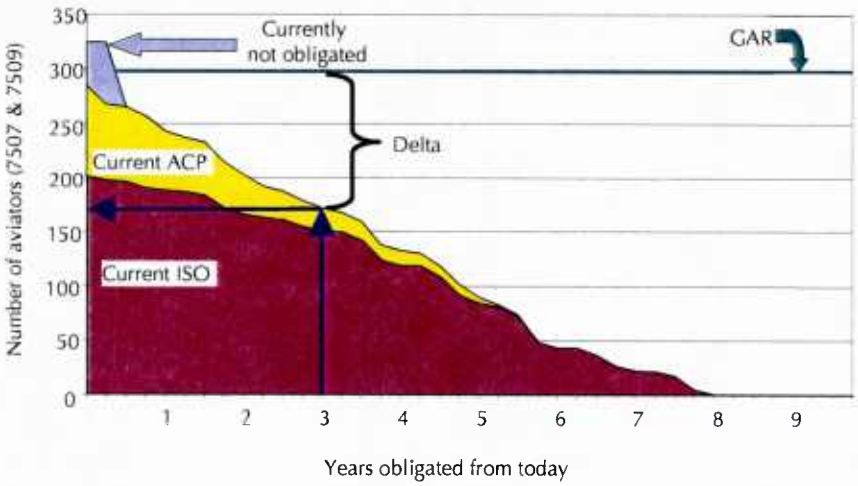
Figure 48. AV-8B pilots under ACP



Stacking these figures on a common scale results in the composite current inventory distribution displayed in figure 49. Therefore, the total number of aviators currently in the inventory who will be available at some future time is identified by the top of the stacked areas at that time. For example, the Marine Corps can be confident that in

3 years it will still have at least 171 of the currently qualified AV-8B aviators. For comparison with requirements, we have superimposed a line representing the sum of the Captain and Major GARs. Now we can compare the known inventory with that GAR and calculate the Delta that must be filled. The tools to fill that Delta are the training pipeline, which produces more ISO obligated aviators, and ACP policy, which entices more or fewer aviators to re-obligate.

Figure 49. Current AV-8B inventory distribution



The one group we have not discussed yet is made up of nonobligated aviators. We derive this inventory by subtracting all the obligated aviators from the count of all qualified aviators. These aviators help the Marine Corps meet near-term manning requirements, but there is no certainty of how long they will remain available. For our proof of concept, we have charted them as being available for the next 6 months. When actual data are incorporated in the indicator, the length of their availability can be refined (e.g., an aviator with an approved resignation package will have a specified separation date, which would be plotted accordingly).

Future inventories

Forecasting future inventories will require estimating the number of aviators who will incur obligations subsequent to satisfying their ISO. We are developing a simulation to provide these estimations. We present here figures based on fictitious data as a proof of concept, displaying our envisioned future inventory indicator.

Our indicator displays future inventory distributions, which will be useful for both General and action officers. We illustrate our concept starting with the final product, a composite chart appropriate for higher level briefings (figure 50) that displays the overall inventory distribution. Then we display supporting charts (figures 51 through 55) that will be useful at the action officer level, highlighting specific portions of the inventory. Our axis convention and interpretation remains the same, with the vertical axis displaying the number of aviators, and the horizontal axis displaying years obligated from today.

Figure 50. Overall estimated distribution of AV-8B pilots

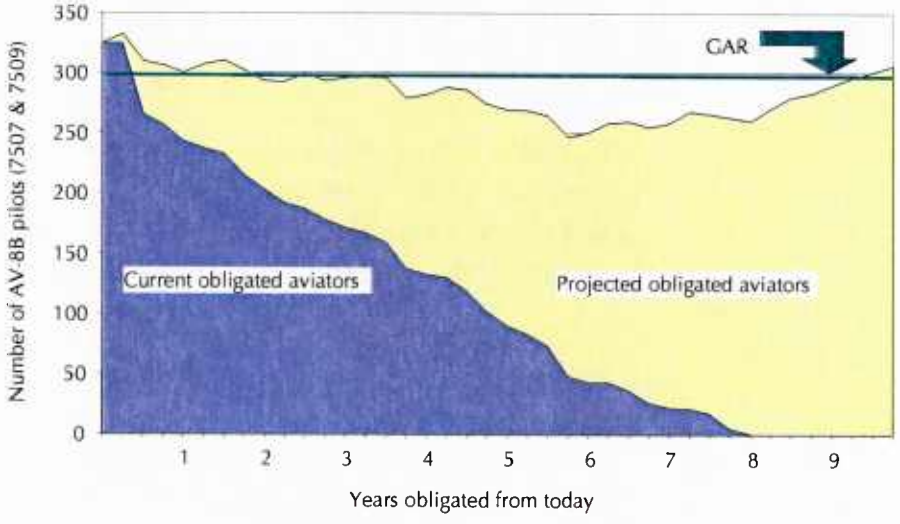


Figure 50 shows the overall AV-8B estimated inventory, categorized only as known (dark shaded area) or estimated (light shaded). Here, "known" refers to aviators obligated in the current inventory and will

remain on active duty for their obligation's duration.[33] This is just the current inventory distribution as displayed in figure 49 without separate areas showing the types of obligations (ISO, ACP, and no obligation). Because obligations are finite, the number of aviators under current obligations decreases with an increase in time, and the dark shaded region shrinks the further we look into the future. We estimate that some aviators will incur new obligations when their current commitment expires, and newly qualified aviators with ISOs will enter the inventory. These "estimated" obligations increase with an increase in time, and so the light shaded region expands the further we look into the future. We have plotted the GAR for comparison of estimates with the requirement.

Using the aviation inventory forecasting model to anticipate and prevent future shortfalls

As an example of how this indicator can be useful, note that our fictitious data show current and estimated inventories will sufficiently meet the GAR through the next 3.5 years. At that point, however, there is an overall drop in the inventory that will keep the inventory below the GAR through the 9-year mark. This would serve then as a leading indicator of an AV-8B pilot shortfall. At this point, action officers would be able to use the following, more detailed graphs to isolate and analyze the probable cause and possible courses of action.

Figure 51 shows the underlying categories of known and estimated obligations that made up figure 50. These categories, by themselves and combined with others, can yield useful information to isolate and analyze underlying trends and identify possible courses of action.

Looking first to the current and estimated ISOs (figure 52), we see that the inventory of aviators under ISOs is not at a steady state. According to the current production plan (notional), the Marine Corps will not produce AV-8B pilots at a sufficient rate to maintain the aviator-obligation distribution for the ISO portion of the inventory. The decrease in ISO inventories corresponds with the latter portion of the overall inventory shortage displayed in figure 49. Note that our future ISO inventory is a function of both future production and

33. This assumes that the aviator will not prematurely end active service as a result of unforeseen events (e.g., untimely death).

current distribution. This means that stabilizing the future inventory might require surge production to overcome previous shortages. We believe the presentation in figure 52 is a good indicator of when these previous shortage effects will be felt, allowing the Marine Corps to plan on how to mitigate these effects.

Figure 51. Overall estimated distribution of AV-8B pilots (detailed)

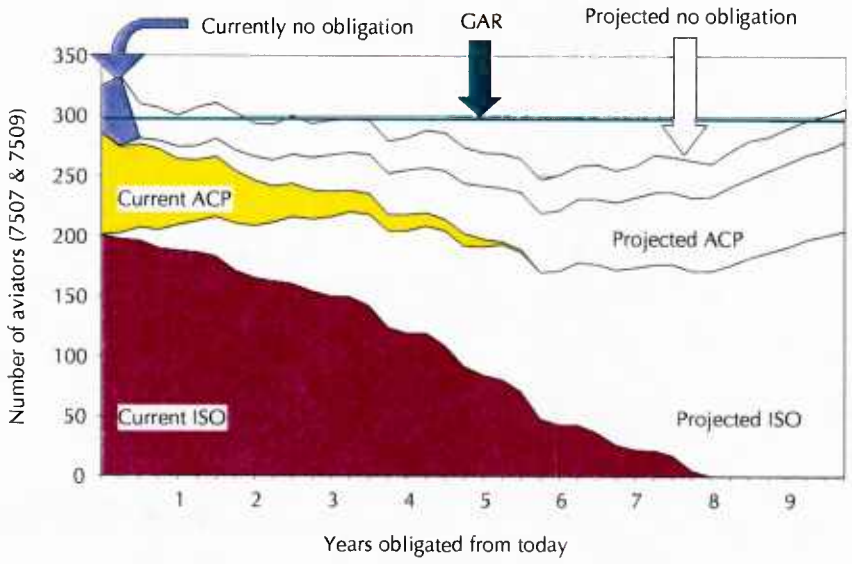
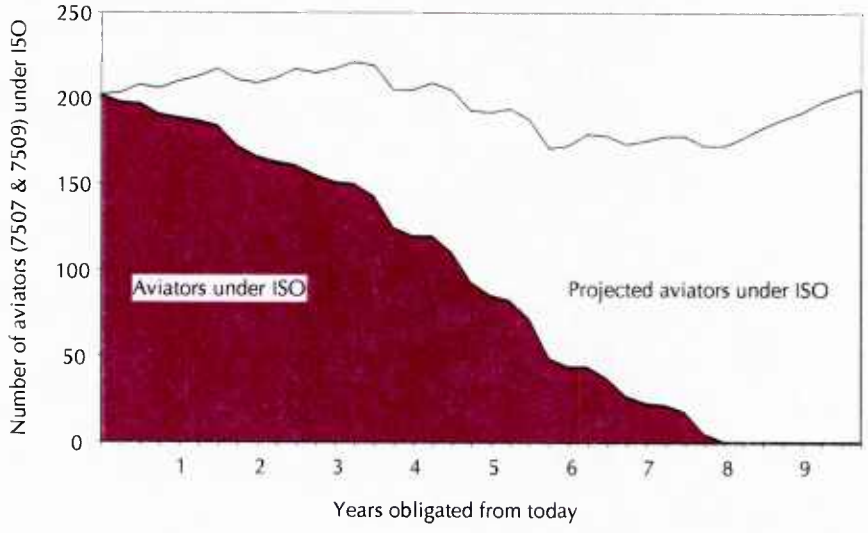
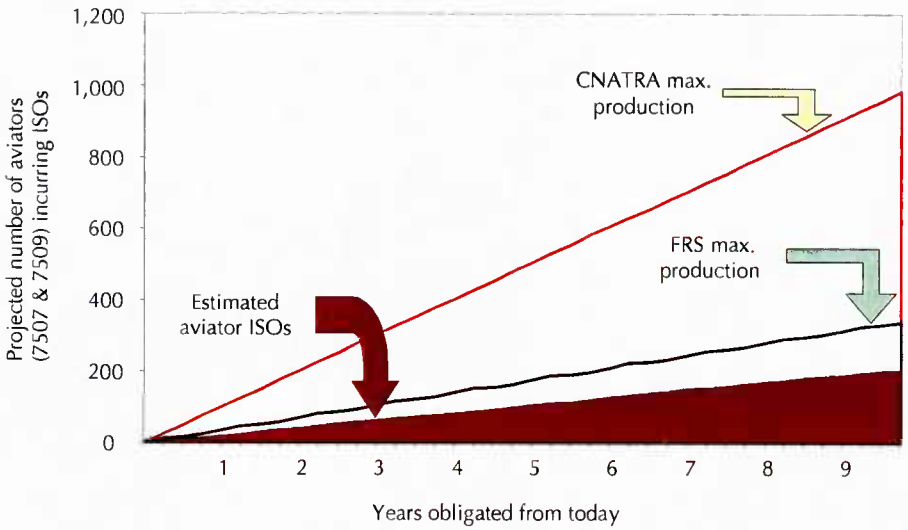


Figure 52. AV-8B pilot current and estimated ISO portions of the overall inventory



Isolating information further, figure 53 shows our estimated ISOs, which correlate to newly winged aviators—in this case, AV-8B pilots. For reference, the Fleet Replacement Squadron (FRS) maximum production rate and Chief of Naval Air Training's (CNATRA's) overall Marine Corps, fixed-wing production plan are plotted. Again we used fictitious data in our proof of concept. In a working product, these data could be easily estimated from FRS and CNATRA production plans.

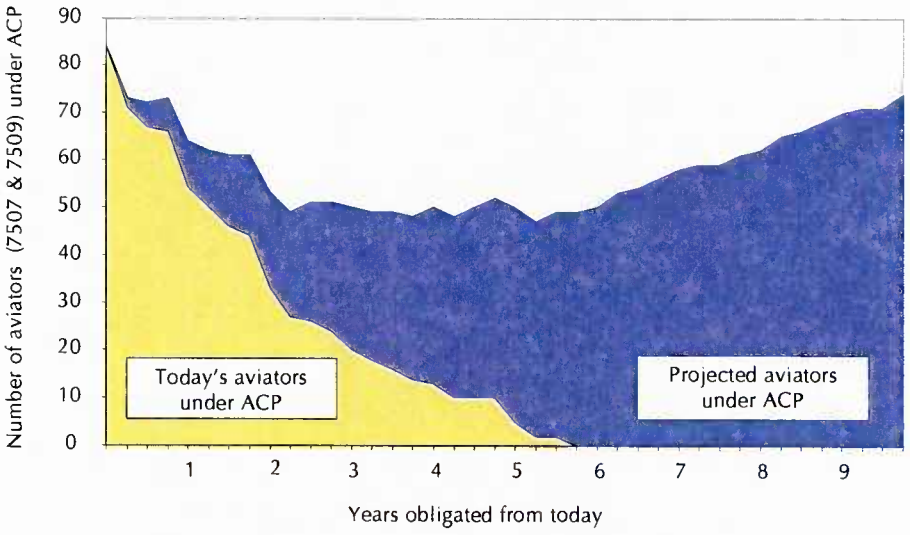
Figure 53. Projected future AV-8B initial service obligations



In the notional data that follow, the estimated aviators arrive to the FRS at a lower rate than the FRS's maximum production capacity. This demonstrates that winging more AV-8B pilots is a possible course of action. The CNATRA maximum fixed-wing production line would be the upper limit of this increase, and any increase exceeding the FRS maximum production rate would have to be accompanied by additional FRS resources. Our indicators provide a quantitative link between projected shortfalls and requests for increased resources.

Figure 54 displays the current and estimated ACP obligations, based on notional data. Real data will be based on take-rates and flows into and from the ISO and nonobligated portions of the inventory. Figure 54 shows a projected ACP inventory decrease during the next 2 years, not returning to current levels for about 9 years.

Figure 54. AV-8B pilot current and estimated ACP portions of the overall inventory



Once an issue has been identified and analyzed, our simulation can be utilized as a course-of-action development tool. For example, assume our notional data are based on an ACP take-rate of 85 percent. The responsible action officer can vary the take-rate in our simulation to determine what take-rate is necessary to offset the shortfall. Suppose he finds that a 90-percent take-rate will meet the requirement. Then, he can determine how much bonus money would be required to get a 90-percent take-rate. In this way, he will use our simulation to quantitatively tie the amount of the bonus to meeting the requirement.

We believe these inventory distributions collectively provide overall indicators of the aviator community's health, and enable the isolation, analysis, and course-of-action development required for action officers to effectively respond to impending shortfalls.

Additional recommendations that arose from the study

In the course of the study, we worked on two additional topics that did not lead directly to critical indicators, namely:

- PMOS health (short, balanced, and over MOSs)
- Postings of accessions and separations.

Through these analyses, we did develop some recommendations for improvements in the manpower process. For the first, we suggest changing the current Marine Corps definition for PMOS health; the current definition seems to overlook issues in very large MOSs while focusing too much attention on issues in very small MOSs.

For the second, we unsuccessfully attempted to improve endstrength forecasting by modeling late (next month) accession and separation postings. Even though the models were successful statistically, they lacked the precision required for use by endstrength planners who must project within a band of 2 percent over and 0.5 percent under. Thus, we are not optimistic that modeling can increase the accuracy of the endstrength projections.

If we can't model late postings with the required accuracy, the only alternative we see is to reduce the number of late postings, particularly in September. These late postings seriously complicate the strength planners' task of meeting endstrength. This chapter reviews some of our work in these two areas.

Changing the definition of short, balanced, and over MOSs

Currently, the Marine Corps defines short, balanced, and over MOSs in relation to their manning as a percentage of the GAR:

- Short: PMOS is less than 90 percent of GAR

- Balanced: PMOS is between 90 to 110 percent of GAR
- Over: PMOS is more than 110 percent of GAR

We propose changing this definition to reflect *both*

- Percentage fill
- Number of Marines that are over or under.

It is difficult to get a handle on PMOS manning levels because of the number of PMOSs and because of the substantial variation in size. To get an overview of PMOS health, the Marine Corps uses categorizations (short/balanced/over) to establish common manning indicators. For example, this spring when Marines were put on stop-loss orders, the initial cut on stop-loss occupations was the list of short PMOSs. In short, such categorizations are useful to the Marine Corps. However, we believe these categorizations will be more useful if they reflect both percentage fill and numbers over and under.

The large variance in PMOS population size makes a strictly percentage-based categorization suspect. Under the current percentage-based categorization, a PMOS GAR requirement of 1,000 Marines is balanced when it has 100 Marines less than its requirement (90 percent of GAR), whereas a PMOS GAR requirement of 35 Marines (e.g., PMOS 6464) is short when it has 4 Marines less than its requirement (87 percent of GAR). An actual instance occurred last spring when 0311s were balanced while manned more than 600 under the GAR requirement.[34] *That is roughly the equivalent of five rifle companies of 0311s!* In contrast, some very small MOSs missing only 1 or 2 Marines were on the short list (for example, PMOS 2674 and PMOS 1181).[35]

34. This is E1 to E5.

35. The current definition suggests that Marines in small PMOSs are *much more valuable* than Marines in large PMOSs. This makes little sense.

Suggested changes in definition

Modest change in definition

- Short: PMOS is less than 90 percent of GAR
  OR at least 100 Marines below the GAR requirement
- Over: PMOS is more than 110 percent of GAR
  OR more than 100 Marines above the GAR requirement
- Balanced: PMOS does not satisfy either the defintion for Short or the definition for Over

CNA's preferred definition

- Short: PMOS is less than 90 percent of GAR
  AND at least 10 Marines below the GAR requirement
  OR
  PMOS is at least 100 Marines below the GAR
- Over: PMOS is more than 110 percent of the GAR
  AND at least 10 Marines above the GAR requirement
  OR more than 100 Marines above the GAR
- Balanced: PMOS does not satisfy either the defintion for Short or the definition for Over.

Case study of short PMOSs: OccField 03 (through sergeant)

In October 2001, Marine Corps infantry occupations showed substantial shortages.[36] Could these problems have been better anticipated? We believe our proposed definitions of short and over PMOSs would have helped considerably. The new definitions would have alerted the Marine Corps much earlier to this problem.

Excluding PMOS 0300 (initial training) and the Infantry Unit Leader career PMOS, the GAR was 22,796 and the on-hand inventory was 20,637—*a shortage of 2,159 Marines in the infantry PMOSs.* Virtually all

36. We exclude PMOS 0369 in this discussion because this PMOS begins at the grade of staff sergeant.

of these shortages in October 2001 were in the grades through corporal.

How much of a problem is this? Could the problem have been foreseen? First, the Marine Corps is always below average in the number of trained Marines during the fall because half of Marine Corps accessions enter during the summer months and they are still in training during the fall.[37] Still, these infantry shortages in October are large and put many infantry occupations under 90 percent of requirements (the official definition of "short").

Infantry PMOSs that were at least 100 short in October 2001 were:

- 0311 Rifleman: 1,509 Marines short (88.6 percent of the 13,254 GAR requirement).
- 0321 Reconnaissance Man: 147 short (76.0 percent of the 612 GAR requirement).
- 0331 Machine Gunner: 303 short (89.2 percent of the 2,818 GAR requirement).
- 0341 Mortarman: 126 short (95.4 percent of the 2,756 GAR requirement).
- 0351 Assaultman: 119 short (106 privates through corporals al 13 sergeants). This is 93.6 percent of the 1,849 GAR requirement.

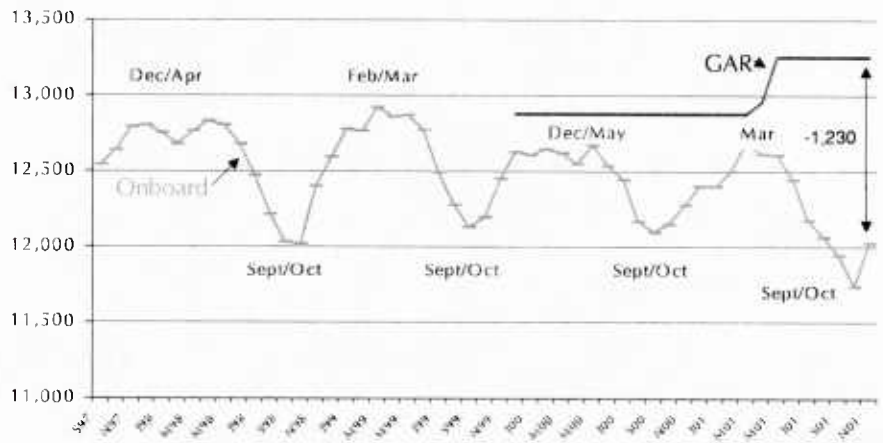
Let's look back to May 2001, a period when most infantry PMOSs were also considerably under requirements. At that time, the number of trained Marines usually well exceeded the GAR requirement. But, in May 2001 shortages through the grade of corporal were 587 Riflemen, 87 Reconnaissance Men, 155 Machine Gunners, and 26 Mortarmen. None of these May shortages, however, put these PMOSs under 90 percent of requirements. *Thus, in May 2001, these PMOSs were categorized as balanced.* In short, the MOS health indicators provided *no* warnings of impending problems.

37. During the fall, the number of trained Marines is at a low and the overall strength in the Marine Corps is at a high.

Critical indicator: exploit the seasonality

Figure 55 shows the onboard and the GAR requirement for 0311s since September 1997. The very large 0311 PMOS population and the relatively short training time cause a clearly seasonal pattern in strength. September and October are the low points for warfighter strength; the December through May period is the high point. *If a PMOS is under strength in December through May (the high point), it will probably be considerably under strength in the following fall, the low point.* Let's look next at the 0331s who have a slightly longer training period and a smaller, though still large, requirement (figure 56).

Figure 55. Onboard and requirements for Riflemen (0311)[a]



a. Source: TFDW and GARs.

Figure 56 shows that Machine Gunners were over strength at the beginning of FY98. They have been coming down in strength throughout the period, so this makes the seasonality somewhat less apparent. Still, one can see the September and October lows and the increase in strength in the spring.

As we have suggested, spring is the season when most PMOSs will have the largest number of trained Marines. Both 0311 and 0331 were more than 100 under the GAR requirement last spring. If we had compared onboard versus GAR in the spring, we could have identi-

fied an upcoming problem. Namely, the difference between the GAR and the onboard should always be expected to widen through the fall *unless specific measures have been taken to prevent that from happening.*

Figure 56. Onboard and requirements for Machine Gunner (0331)[a]

a. Source: TFDW and GARs.

Summary

In summary, we believe that revising the MOS health definition for short, balanced, and over PMOSs is necessary. Furthermore, we believe that the Marine Corps will be better able to anticipate problems if it evaluates MOS health in the context of seasonality. *Shortages in the fall are not necessarily serious; shortages in the spring, however, should be more cause for concern.*

Endstrength and postings

In 2001, manpower planners feared they would exceed endstrength, primarily because of extremely low non-EAS losses. In late spring, the accession requirements were reduced by 1,000, but by summer it appeared that endstrength would still be exceeded. Further accession cuts followed, and the Marine Corps met its enlisted strength goals, Because of the attention earlier in the year, DC M&RA specifically

requested that the study team look at measures of strength and see how the Marine Corps could improve reporting and forecasting. We proposed modeling the timing of separation and accession postings. Here, we suggest that endstrength forecasting might be improved if we understood the impact of weekends and holidays on the separations and accession posting.

New information enters MCTFS personnel files after a diary clerk enters the information and the information is "posted" to the system. These system-wide updates occur about 25 times each month. If a separation that occurs on 30 September is not posted until 2 October, the separated Marine will mistakenly be counted on 30 September as part of endstrength. Similarly, if an accession arrives at an MCRD on 30 September, the system will only count the accession if the diary entry is made before the final system update for the endstrength counts on 30 September.

We would hope that commanders with reporting unit responsibilities could improve the timeliness of separation and accession postings. For separation postings, there may be some administrative procedures that could be streamlined. For example, separations for Marines with less than 8 years of service[38] cannot be posted before the Marine is accessed into the Individual Ready Reserve (IRR). There may be some other financial requirements (no outstanding debts to the service) that must be satisfied before the separation can be posted.

Attempts to model postings

Other than random noise, we identified two reasons for lags in the accession and separation postings:

- Regular year-to-year lags: For example, because of New Year's Eve, actions in late December are more likely to be posted late than actions in February. Most holidays are regular from year to year, involving predictable shutdowns of administrative activities.

38. Eight years is the universal service obligation.

- Irregular but predictable lags: These lags would not be regular from year to year but could be predicted for a particular year. Accessions or separations on weekends are likely to be reported the following week. This situation can be problematic if the following week occurs in the next month.

Separation postings

We worked with the enlisted strength planner to obtain data, and did considerable analyses of separations. Our goal was to model the probability that a separation will be posted during the month the event occurred (or the month after the event occurred).[39] Because we must report endstrength on one day, 30 September, we need to get a better handle on events that occur in one month but are reported in the next.

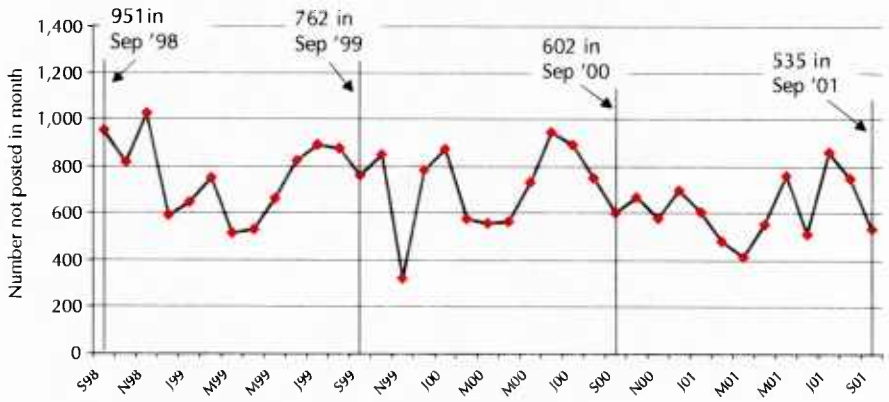
Substantial numbers of separations are posted late. An average of 27 percent of separations were posted in the following month during the 3-year period from September 1998 to September 2001. Figure 57 shows the number of following-month separation postings, and the substantial numbers each September are cause for concern. Because these separations would not show up until the next month (October), these Marines would mistakenly be counted in the 30 September endstrength calculation.

Accession postings

While the endstrength planner has separation models (entry-level, EAS, non-EAS), the planner obtains accession forecasts and accession actuals from Marine Corps Recruiting Command. In the past, it was quite unusual for MCRC's accession numbers to differ from accession postings. Since June 2001, however, there have been several hundred accessions each month that did not post until the following month. This is a serious problem because the planner has no way to "model" accessions, but must depend on accurate numbers from MCRC. Figure 58 shows the problem.

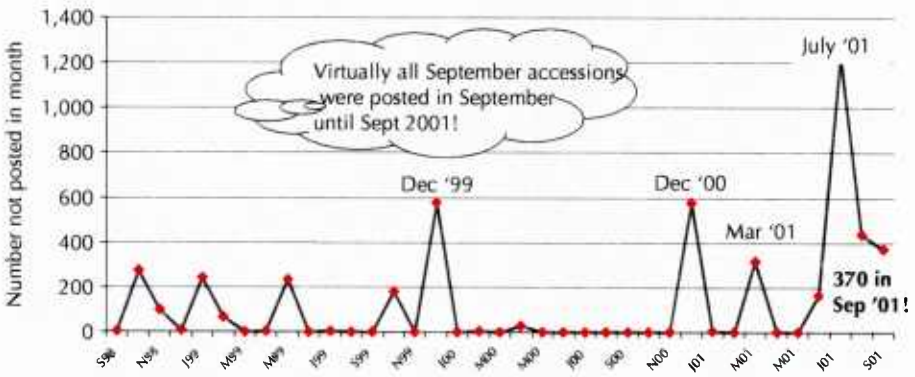
39. Accession timing is managed by MCRC and cannot be reasonably modeled.

Figure 57. Number of separations posted in the month after they occur[a]



a. Source: TFDW (data for enlisted Marines from September 1998 through September 2001).

Figure 58. Number of accessions that are not posted until the following month[a]



a. Source: TFDW (data for enlisted Marines from September 1998 through September 2001).

Summary

The Marine Corps must fix the late-accession-posting problem, with the endstrength planner obtaining the accurate number of accession postings that occur each month from MCRC. We are confident that this will happen. For separations, however, the endstrength planner must still rely on his models. Our late-separation-posting work

resulted in several model specifications that "fit" the data well and seem to have considerable predictive power.[40] For this particular problem, however, the endstrength planner must predict strength within a very small window (2 percent over or 0.5 percent under). Our models' "noise to signal" ratio is too high to provide that precision. Unless we can improve our models' precision, we think they will be of little use to the strength planner.

40. The adjusted R-square values are all about .61, which by econometric standards is extremely high for individual-level data. It is not, however, sufficiently precise for endstrength planners who must forecast within extremely narrow boundaries.

Appendix A: The GAR and personnel inventory

This appendix includes additional information about the following:

- Our comparisons of requirements, as defined by the GAR, and the number of officers in particular grades and MOSs
- Our comparison of MOS training requirements, as defined by the GAR, and the number of Marines with training MOSs.

Officer requirements and inventory comparisons

The figures that follow are the officer comparisons for:

- O1-O3 fixed-wing pilots (figure 59)
- O4-O5 fixed-wing pilots (figure 60)
- O1-O3 naval flight officers (NFOs) (figure 61)
- O4-O5 NFOs (figure 62)
- O1-O3 C4I officers (figure 63)
- O4-O5 C4I officers (figure 64)
- O1-O3 combat support officers (figure 65)
- O4-O5 combat support officers (figure 66).

Among these groupings of grades and MOSs, only O4-O5 NFOs, O1-O3 C4I officers, and O1-O3 combat support officers have inventories that exceed the GAR in recent months.

Figure 59. O1-O3 FW pilots: GAR vs. onboard vs. grade-MOS fit

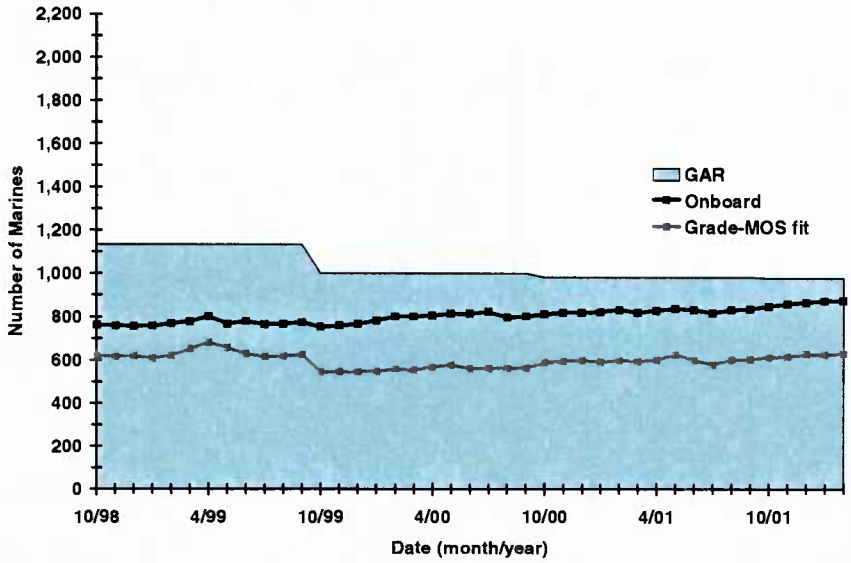


Figure 60. O4-O5 FW pilots: GAR vs. onboard vs. grade-MOS fit

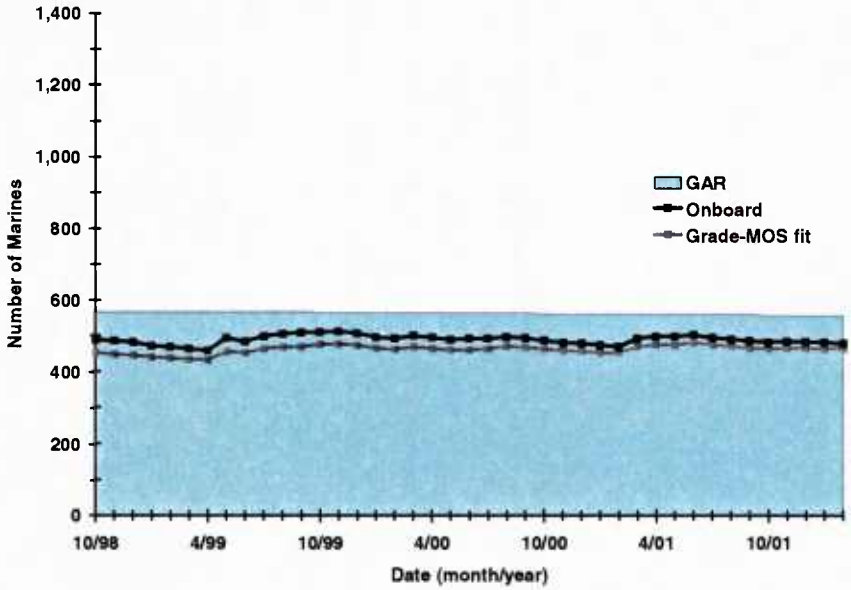


Figure 61. O1-O3 NFOs: GAR vs. onboard vs. grade-MOS fit

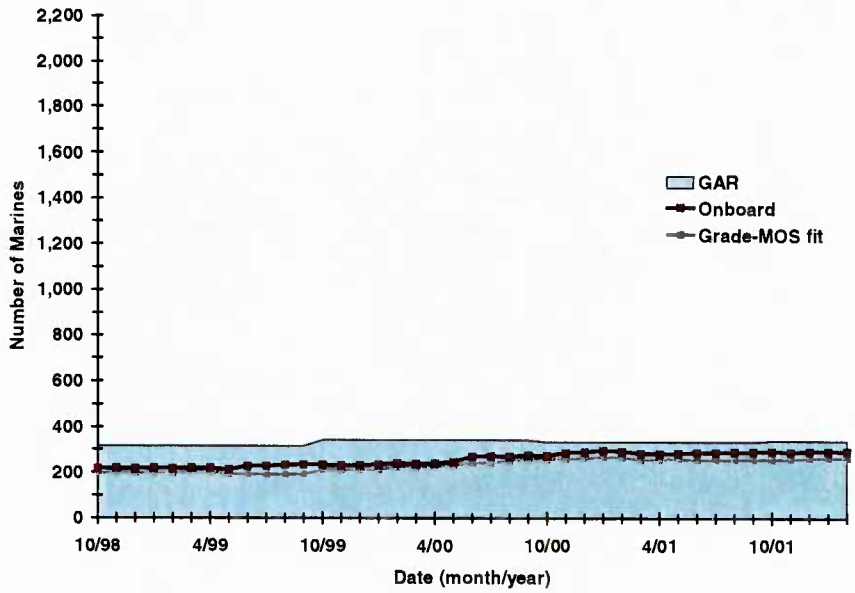


Figure 62. O4-O5 NFOs: GAR vs. onboard vs. grade-MOS fit

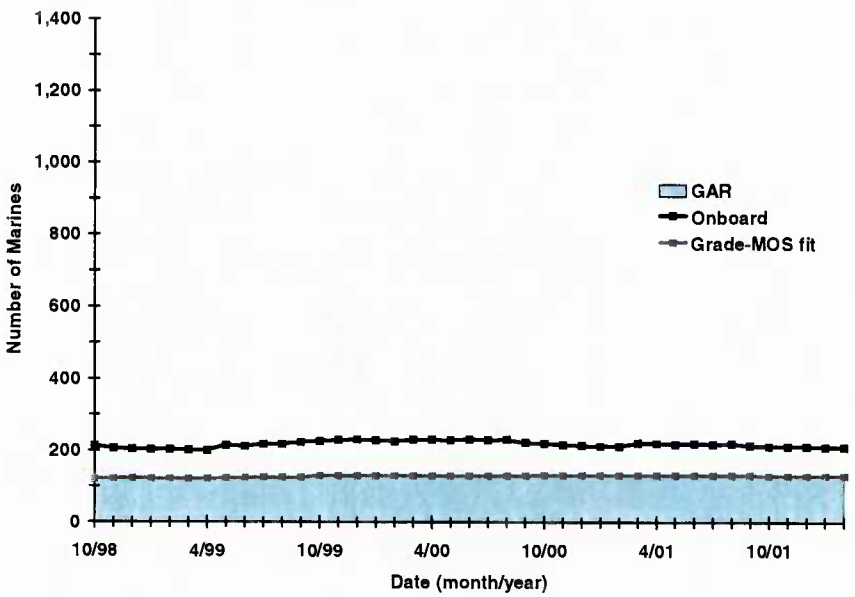


Figure 63. O1-O3 C4I: GAR vs. onboard vs. grade-MOS fit

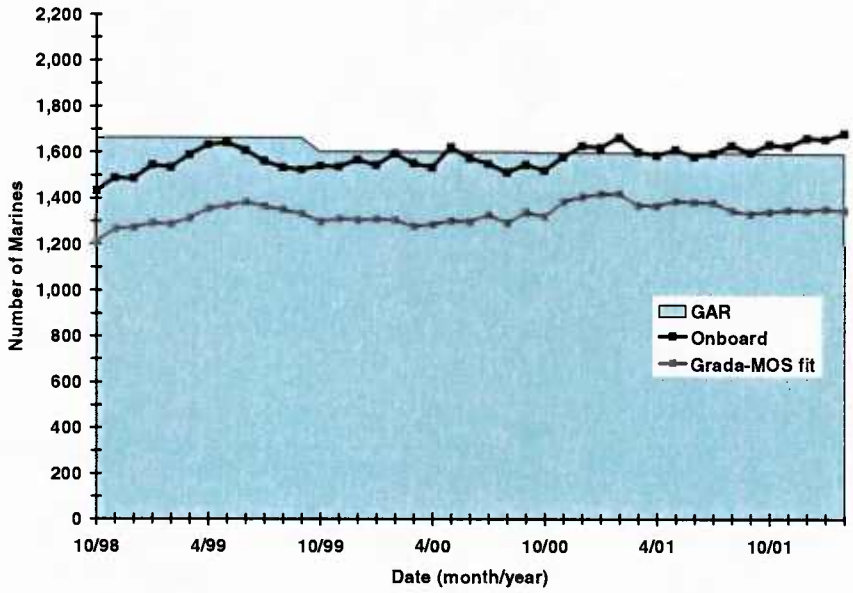


Figure 64. O4-O5 C4I: GAR vs. onboard vs. grade-MOS fit

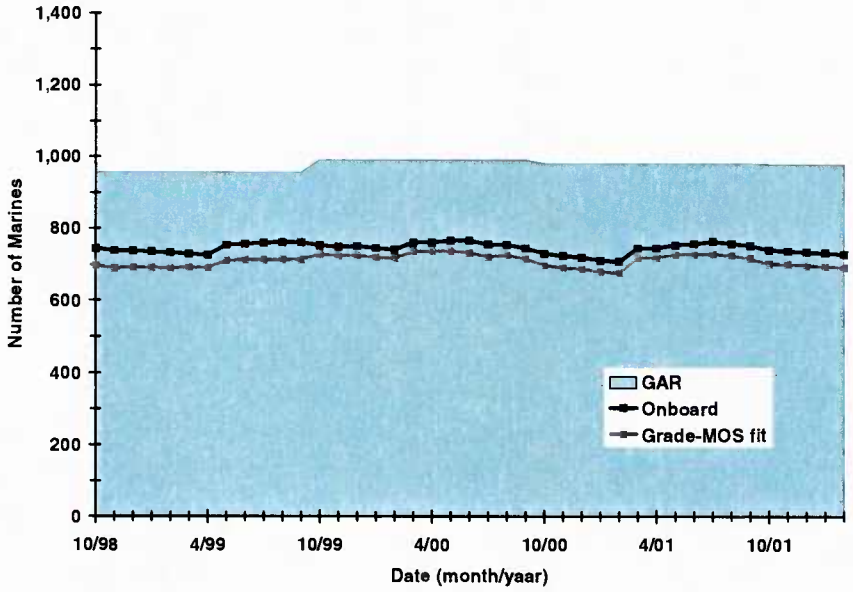


Figure 65. O1-O3 combat support: GAR vs. onboard vs. grade-MOS fit

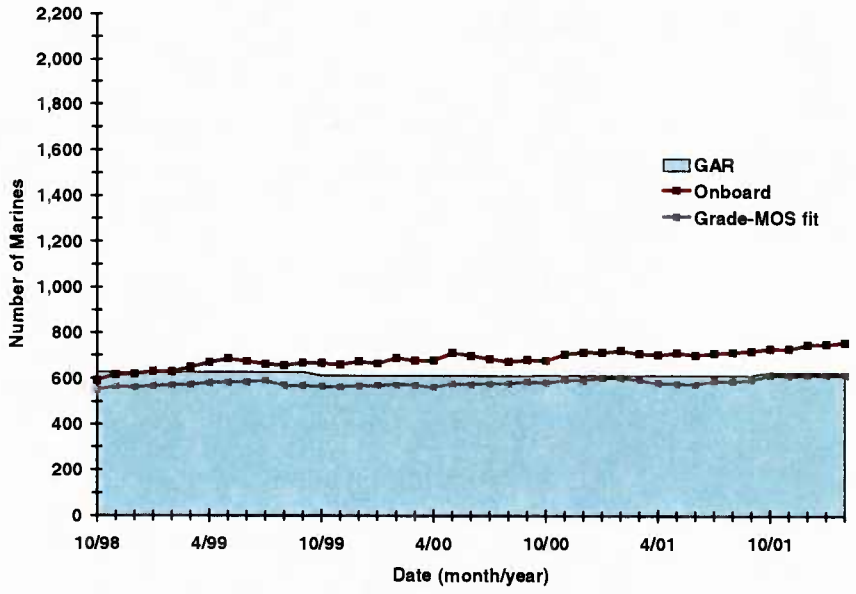
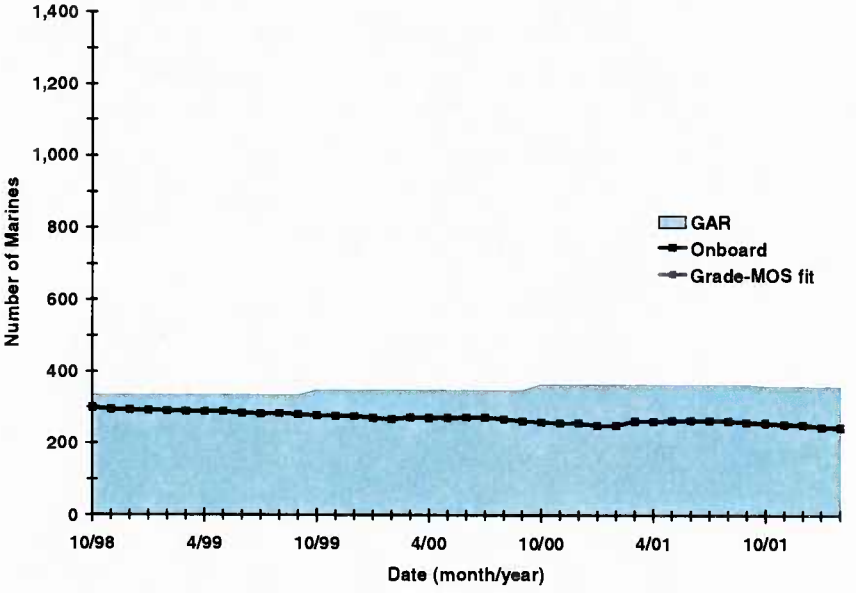


Figure 66. O4-O5 combat support: GAR vs. onboard vs. grade-MOS fit



The GAR and training MOSs

GAR requirement

Marines enter with MOS 9900 (Basic recruit) or 9971(Recruit with enlistment guarantee). The Training and Education Command (TECOM) and Manpower Policy (MP) report the following planned training times:

- Recruit training (5 forming days and 84 MCRD days)
- Boot leave (10 days)
- For all Marines except those in the infantry (03) MOS, Marine Combat Training (MCT) 22 days
- One additional day.

Thus, planned pre-MOS training is 122 days, except for the infantry occupations where it is 100 days.

The current GAR requirement for recruit training MOSs (9900 and 9971) includes about 90 man-days per accession. Thus, the GAR requirement appears to roughly reflect planned bootcamp. *In order to align the GAR entry-level training requirement with MOS entry-level training assignments, we have recommended that the GAR requirement be changed to reflect all planned time from accession to the start of formal MOS training. Thus, the GAR requirement for MOSs 9900 and 9971 would be 100 days for infantry MOSs and 122 days for all other MOSs.*

Assignment of training MOSs

To determine what MOS Marines hold in the PMOS field in the early stages of training, we analyzed the PMOS attainment date variable and the associated value in the PMOS field.[41] We looked for training MOSs (0100, 0200, 0300, etc.). We had two questions:

- *When do Marines currently get their training PMOSs?* If the award were consistent with the current GAR requirement, the MOS should be awarded after the end of boot camp, at about 90 days of service.

41. We did not find intended MOS (IMOS) to be a useful field.

- *Over the period of a year, is the number of Marines in a training MOS (generally an occupational field) consistent with the number of Marines that will be awarded a PMOS in that occupational field?* If the field is correctly used, we would expect the number of Marines in the training MOS to be similar to the number of Marines awarded a regular PMOS.

Currently, not all Marines in entry-level training are assigned a training MOS; moreover, the timing of the assignment of training MOSs varies widely. *To make entry-level training indicator operational, all schoolhouses will have to enter the training MOS when Marines begin formal MOS training.*

Table 3 shows our tabulation for the June 2001 through May 2002 period. For example, during the period, 242 entry-level Marines were awarded the Admin field (0100) training MOS, but 1,548 new Marines obtained regular PMOSs in the Admin area. Clearly, not everyone was awarded the training MOS of 0100. In addition, the training MOS of 0100 was only awarded after an average length of service of 176 days—way past the end of boot camp and probably after the formal A-school began.

Thus, to measure whether or we are training new Marines to the requirement for new Marines, some work will have to be done. To summarize:

- Ensure that the GAR requirements for pre-MOS training (9900 and 9971) represent all the training time before PMOS school. Currently, that would be 100 days for infantry occupations and 122 days for noninfantry occupations.
- As soon as the Marine arrives at a PMOS producing school, the school should enter
  - — The training MOS in the PMOS field
  - — The date of arrival in the PMOS attainment field.
- As soon as the Marine achieves a regular PMOS, the school should enter
  - — The regular PMOS in the PMOS field
  - — The date of attainment in the PMOS attainment field.

If the Marine Corps adopts these recommendations, it will have a way to continuously evaluate whether the training of new Marines is in the MOSs represented by Marine Corps requirements.

Table 3. Training MOSs and regular MOSs: Entry-level Marines awarded PMOSs from June 2001 through May 2002

Training MOS or Occ-field	Name	Awarded training MOS in Occfield		Awarded regular PMOSs in Occfield	
		No. of Marines	Average days until training MOS	No. of Marines	Do awards fit with no. in training?
0100	Basic Administrative Marine	242	176	1,548	No
0200	Basic Intelligence Marine	122	137	205	No
0300	Basic Infantryman	3,358	131	5,410	No
0400	Basic Logistics Marine	141	126	582	No
0500	Basic MAGTF Planning Specialist	41	184	45	Maybe
0600	Basic Operational Communicator	1,531	144	2,042	No
0800	Basic Field Artillery Man	709	136	722	Maybe
1100	Basic Utilities Marine	793	134	559	Maybe
1300	Basic Engineer, Construction, and Equipment Marine	1,559	136	1,602	Maybe
1800	Basic Tank and Assault Amphibious Vehicle Crewman	1,208	93	392	No
2100	Basic Ordnance Marine	946	160	772	Maybe
2300	Basic Ammunition and Explosive Ordnance Disposal	280	141	279	Maybe
2500	Basic Operational Communicator	2,113	117	161	No
2600	Basic Signals Intelligence/Ground Electronic Warfare	648	176	307	No
2800	Basic Data/Communications Maintenance Marine	1,880	99	1,521	Maybe
3000	Basic Supply Admin. and Operations Marine	1,369	389	1,413	Maybe
3100	Basic Traffic Management Marine	101	1,439	119	No
3300	Basic Food Service Marine	501	149	305	No
3400	Basic Auditing, Finance, and Accounting Marine	49	2,139	217	No
3500	Basic Motor Transport Marine	2,149	1,409	2,945	No
4000	Basic Data Systems Marine	1,586	113	725	No
4400	Basic Legal Services Marine	2	197	84	No

Table 3. Training MOSs and regular MOSs: Entry-level Marines awarded PMOSs from June 2001 through May 2002 (continued)

Training MOS or Occ-field	Name	Awarded training MOS in Occfield: No. of Marines	Awarded training MOS in Occfield: Average days until training MOS	Awarded regular PMOSs in Occfield: No. of Marines	Awarded regular PMOSs in Occfield: Do awards fit with no. in training?
4600	Basic Training and Visual Information Support	18	126	72	No
5500	Basic Musician	118	139	113	Maybe
5700	Basic Nuclear, Biological, and Chemical Marine	165	205	169	Maybe
5800	Basic Military Police and Corrections Marine	538	135	820	No
5900	Basic Electronics Maintenance Marine	562	192	259	No
6000	Basic Aircraft Maintenance Marine	3,047	145	833	No
6111	Helicopter Mechanic - Trainee	28	310	979	No
6300	Basic Avionics Marine	191	175	507[a]	No
6311	Aircraft Comm/Navigation/Electrical/Weapon Technician	1,391	146		
6411	Aircraft Comm/Navigation Systems Technician	74	395	591	No
6500	Basic Aviation Ordnance Marine	131	159	443[b]	No
6511	Aviation Ordnance Trainee	88	210		
6600	Basic Aviation Supply Marine	401	145	328	Maybe
6800	Basic Weather Service Marine	49	139	57	Maybe
7000	Basic Airfield Services Marines	554	135	446	Maybe
7200	Basic Air Control/Air Support/Anti-Air Warfare Marine	462	158	652	No

a. There were 507 Marines who received their first regular PMOS in the 63xx Occfield in the period. We are not clear how to split them between 6300 and 6311 (both training MOSs).

b. There were 443Marines who received their first regular PMOS in the 65xx Occfield in the period. We are not clear how to split them between 6500 and 6511 (both training MOSs).

Table 4 presents similar information for officers.

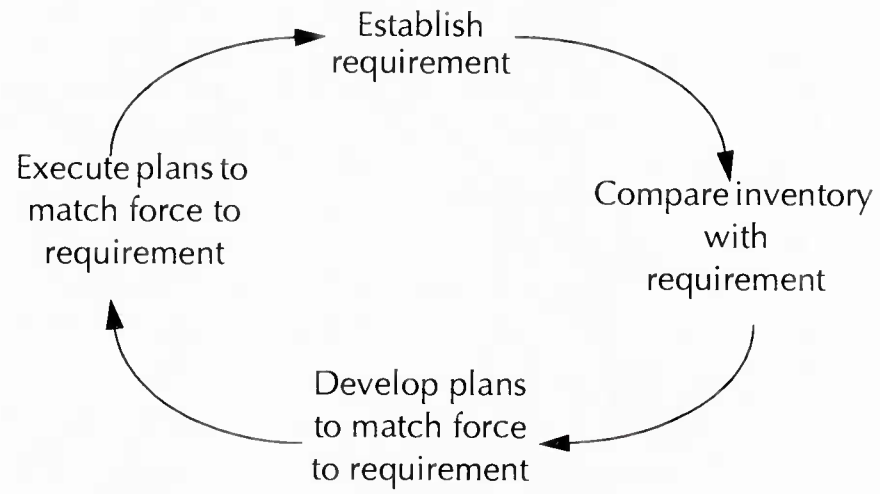
Table 4. Average number of days from accession to receipt of officer training MOS

Training MOS	Name	Total days	Number of Marines	Average days per Marine
0101	Basic Personnel and Administrative Officer	8,410	37	227.3
0201	Basic Intelligence Officer	16,509	76	217.2
0301	Basic Infantry Officer	31,438	151	208.2
0401	Basic Logistics Officer	22,544	106	212.7
0601	Basic Communications Officer	16,603	71	233.8
0801	Basic Field Artillery Officer	13,911	67	207.6
1301	"Basic Engineer, Construction, and Equipment Officer	10,881	40	272.0
1801	Basic Tank and Amphibian Vehicle Officer	4,721	22	214.6
3001	Basic Supply Administration and Operations Officer	13,797	52	265.3
3401	Basic Auditing, Finance, and Accounting Officer	2,166	10	216.6
3402	Disbursing Officer	378	1	378.0
4301	Basic Public Affairs Officer	815	5	163.0
4401	Student Judge Advocate	5,915	44	134.4
5801	Basic Military Police and Corrections Officer	2,022	12	168.5
6001	Basic Aircraft Maintenance Officer	1,866	9	207.3
6601	Basic Aviation	2,518	9	279.8
7201	Basic Air Control/Anti-Air Warfare Officer	6,587	26	253.3
7580	Tactical Navigator Flight Student (NATC)	4,688	45	104.2
7599	Flight Student (TBS)	56,747	467	121.5
9900	General Service Marine	20,496	4,849	4.2
9901	Basic Officer	39,111	771	50.7

Appendix B: Manpower processes, existing MOEs, and critical indicators

This appendix provides an overview of manpower processes, discusses aspects of those processes, and provides additional information on potential indicators. The four simple steps in the manpower process are not always so clearly divided among commands, departments, and action officers. For presentation purposes, we'll organize them into two overall processes: establishing the manpower requirement and inventory development to meet the requirement. Figure 67 shows how these two different views mesh.

Figure 67. Simplified view of steps in manpower process



Manning process

The manning process is the starting point for identifying manpower requirements.[42] It identifies the Marine Corps structure that the

42. Requirements, goals, targets, plans, etc., are all used very loosely in the world of Marine Corps manpower. We will not define these terms, but we will attempt to describe in detail what specific manpower processes are trying to achieve and in what manner.

manpower system will be trying to fill. Manning requirements start with the unit tables of organization (T/Os), maintained by the Total Force Structure Division (TFSD) of the Marine Corps Combat Development Command (MCCDC). T/Os contain information about a unit's mission, organization (number and types of subunits), and billet descriptions (title, grade requirement, and military occupational specialty (MOS) requirement). T/Os are maintained in the Table of Manpower Requirements (TMR) system. The totality of TMR requirements is known as "structure,"[43] which can be thought of as the billets for warfighters. All this structure cannot be filled because it is not affordable.

On 30 September of each year, the Marine Corps is required, by law, to be within 2 percent over or 0.5 percent under the active component endstrength authorized by Congress for that fiscal year. That endstrength does not provide enough personnel to fill all the Marine Corps' structure. In addition, the actual number of Marines in the active component will vary over the course of the year because accessions, resignations, and retirements are seasonal.[44] Finally, a substantial number of Marines are in entry-level training at any given time and are thus not qualified to fill a structure billet.

The manning process establishes priorities for identifying the structure that the Marine Corps intends to build inventory against, within the constraints discussed. The results of the manning process are two documents, the Trooplist and the Adjusted Strength Report (ASR).

Trooplist

The Trooplist provides the total number of T/O spaces, by command and by officer and enlisted, that the Marine Corps intends to fill. The Trooplist takes into account endstrength constraints and estimates of P2T2. (P2T2 abbreviates prisoners, patients, trainees, and transients; it is an estimate of Marine man-years devoted to activities that make Marines unavailable for service in T/O billets.) Manning is not

43. Sometimes also referred to as "spaces."

44. Average strength is less than 30 September endstrength because of both budget constraints and seasonality.

distributed evenly among all commands. Some types of commands may be manned at 100 percent (i.e., all their structure is in the Trooplist), whereas others will be manned at lower levels.

Once the manning numbers have been established at a macro level by the Trooplist, the ASR provides the micro-level details. It is the ASR that specifies which of the billets will be manned and which will be left unmanned.[45] The ASR is also the primary document linking plans developed by TFSD/MCCDC and Marine Corps Manpower. Personnel Management Division (MM) uses the ASR as an input to the Staffing Goal Model (SGM), which is used to develop the plan for distributing the current inventory via the staffing process. Manpower Plans and Policy Division (MP) uses the ASR to generate plans to build the future inventory.[46] Because so many plans are derived from the Trooplist and ASR, it is critical that they be produced by the required dates. *Here also, lateness of these critical documents is an indicator that should be seen by action officers as well as general officers, including at a minimum DC M&RA and CG, MCCDC.*

Manpower process time frame

The structure of the Marine Corps is continually changing. New or different missions may require different types of capabilities, and thus different types of units—sometimes new units altogether and sometimes modifications to existing units. Changes in requirements or organization of particular MOSs, resulting from new technology or different missions, may result in structure changes as well.

There is a well-defined, *but very lengthy process* for proposing, reviewing, and implementing changes to the TMR. That process is managed by Total Force Structure Division, MCCDC. It is not a focus of our study, we merely point out that it is a continual process. This explains, in part, why "requirement" is a somewhat fuzzy notion.

45. The ASR is based on average strength, not endstrength. P2T2 is also based on average strength.

46. CNA Research Memorandum 98-142, *Evaluating the Manpower Inventory Projection Models Used by the Marine Corps Enlisted Plans Section, Volume 1: Analyses,* by William Williamson and Theresa Kimble, November 1998.

Because this requirement is the basis for manpower planning, which in turn establishes goals for execution, the Marine Corps "freezes" the manpower requirement every 6 months. That is, the TMR is frozen in February and August, and those TMR "snapshots" are published as the Trooplist and ASR. It is important that they are published on time because so many other plans are based on the Trooplist and ASR.

The second major process in manpower is inventory development. That is the process of shaping the future inventory to match the requirements derived from the manning process. Inventory development shapes the current inventory of Marines by retaining current Marines and accessing new Marines to match the target inventory defined by the Grade Adjusted Recapitulation (GAR) report.

The GAR

The GAR is generated by Manpower Plans and Policies Division. It is developed from the ASR, anticipated authorized endstrength, and P2T2 estimates for each of 6 years (the current year and the 5 following years).[47] Although the ASR is considerably less than endstrength, the GAR reflects Marine Corps budgeted endstrength. The GAR defines the target inventory or required inventory by MOS and grade, including "mapping" billets that do not have specific MOS requirements (some B-billets) and P2T2 to specific grades and MOSs. Many inventory development plans and processes are based on the GAR.

Inventory development process: new Marines

The inventory development process is a term for a collection of subprocesses for two different sets of Marines: newly accessed Marines and those Marines currently in the force. The three major inventory development subprocesses for new Marines are:

- Recruiting
- Training
- Assignment.

47. While the ASR and P2T2 are average strength documents, the GAR is sized to endstrength and thus it incorporates the delta between average strength and endstrength.

We discuss these subprocesses and describe:

- How plans are formulated
- How plans are executed
- What information is tracked during execution
- Proposed performance metrics.

In our description of these subprocesses, we will highlight the time frame in which these plans are formulated and executed.

Recruiting

The Marine Corps Recruiting Command (MCRC) is the command primarily concerned with recruiting new Marines. M&RA develops plans that determine the accession requirements that MCRC must meet through recruiting.

Accession planning and the recruiting mission

The MCRC's recruiting operations are guided by their recruiting plans, which establish goals in a number of categories, including:

- Overall enlisted accessions (shipping)
- Enlisted net new contracts (NNC)[48]
- Enlisted accession quality goals
- Enlisted options program goals
- Officer commissions
- Officer program goals.

The MCRC's recruiting goals are derived from formal and informal policies and two plans developed by M&RA: the accession plan, which is promulgated in a document called Memo-01, and the enlisted initial classification plan (ICP), which establishes accession goals by MOS.

48. Net new contracts are new contracts less attrition from the delayed entry program (DEP).

Memo-01 has its origins in planning guidance developed by MP and staffed through MCRC and other M&RA divisions. The planning guidance is issued in late spring/early summer before the fiscal year of execution. The planning guidance is the basis for MCRC recruiting plans developed during the summer for the next fiscal year.

Memo-01 is published in late October/early November during the fiscal year of execution. It is based on the planning guidance and updated with the most recent data on attrition behavior, retention, and so on. Memo-01 actually includes three fiscal-year based accession plans: enlisted accessions, commissioned and warrant officer accessions, and reserve accessions. The enlisted accession plan spells out required male and female non-prior-service accessions by month. It serves as the basis for the MCRC mission planning. It is based on the GAR, produced in February before the fiscal year of execution, estimates of non-end-of-active-service (non-EAS) attrition, and estimates of retention behavior. The plans also include overall accession goals for the two fiscal years beyond the fiscal year of execution.

These plans need to be made in advance to allow MCRC to plan mission allocations and recruiting structure changes. It is important to remember that the recruiting focus on high schools and the MCRC's desire to have a large start pool[49] means that a significant amount of the fiscal year's accessions are rising seniors who are contracted the summer before their last year in high school. They are placed in the DEP and typically shipped to recruit training soon after high school graduation.

The officer accession plan specifies the number of newly commissioned officers and warrant officers by source of commission and category. The commissioned and warrant officer accession plan specifies the number and accession category for the next 2 years. Officers are commissioned from the U.S. Naval Academy, Naval ROTC Programs, the PLC, enlisted commissioning programs, and the Officer Candidate Course. Newly commissioned officers are placed into one of

49. The start pool includes those in the DEP at the beginning of the fiscal year. These people will be accessed during the fiscal year. The MCRC tries to build the start pool to be more than 50 percent of the fiscal year's accessions.

several programs: naval aviator, naval flight officer, judge advocate, or ground officer (the last one is really a catchall, including all occupational fields not included in the first three). Warrant officers are selected from the enlisted ranks by selection boards. Memo-01 establishes the overall goals for those boards.

The reserve accession plan specifies the number of prior service officer accessions by training category pay group for the next two fiscal years. The plan also specifies the number of non-prior-service and prior-service enlisted accessions by month. The reserve accession plan is developed by MP and Reserve Affairs (RA) Divisions of M&RA.

The initial classification plan (ICP) is developed by MP, and is the basis for the MCRC's enlisted options program (EOP). This fiscal year plan is derived from the Accession Plan and the GAR. It is typically provided in preliminary form to MCRC in the summer before the execution fiscal year.[50] The EOP includes goals for accessing new Marines into groupings of MOSs, called programs.[51] Between 85 and 90 percent of new accessions are enlisted with a program guarantee. New accessions that are not in a program are known as "open" contracts.

Execution

While recruiting planning is centralized, the execution of these recruit plans is highly decentralized. All planning and tracking of execution is done on the basis of the fiscal year. A great deal of information on individuals that have contracted and newly accessed Marines is collected and maintained in the Marine Corps Recruiting Information Support System (MCRISS), a system that recently replaced the Automated Recruit Management System (ARMS).

50. The ICP is not finalized until after the execution fiscal year starts. The first people accessed during the fiscal year do not graduate until late December or early January, and are not "classified" into a specific MOS until they near their recruit training graduation date.

51. The first-term planner first develops the accession plan by PMOS and only then aggregates them into enlistment programs, which group related MOSs with similar qualifications. A Marine who enlists in a particular program is guaranteed training in one of the program MOSs.

Information

Much of the information that MCRC collects during the course of its operations is summarized in monthly reports and briefings at several levels through the headquarters of MCRC. This information is the primary means by which the MCRC Headquarters gauges how well it is doing in accomplishing its mission. The information that is routinely briefed to the CG, MCRC includes data on shipping, contracting, DEP attrition, MCRD attrition, waivers, and the recruiting force. A regular briefing is also provided to the Commandant of the Marine Corps (CMC) at the OPS/Intel meetings.

All the information is typically available and categorized in a number of different ways, including:

- By the last month and the cumulative results for the fiscal year
- By active and reserve component recruits
- By non-prior-service recruits and prior-service Marines
- By gender and selected race/ethnic group
- By recruiting region and district
- By recruit quality, characterized by tier (based on education credential) and mental group (based on Armed Forces Qualification Test (AFQT) score).

Performance measures

There are many indicators of how well the MCRC is doing in recruiting, based on the information they routinely collect. But the most important indicators for the overall manpower system relate to how well the MCRC is doing in meeting overall accession goals (fill) and how well it is meeting goals to access Marines in specific programs (fit). There is also a temporal dimension to recruiting operations and the manpower system, which is important to capture in any recruiting-related performance measures. The following performance measures are good candidates for critical indicators:

- Shipping vs. accession goals, by month
- Shipping vs. program goals, by quarter

- DEP placement for next 12 months, by month
- Program placement for next 12 months.

The first three measures are routinely maintained by MCRC. The last measure is not, but the data are available. During this study, we did not receive this type of information and have not included a figure showing what the measure might look like.

Manpower planners in M&RA establish the monthly accession goals and quarterly program goals in conjunction with MCRC. MCRC establishes missions for shipping, contracting, and other categories for regions, districts, recruiting stations, and substations. But this finer level of planning and execution is probably not appropriate for the overall manpower process indicators that concern this study.

Entry-level training and assignment

Entry-level training includes recruit training, Marine Combat Training (MCT), and initial MOS training; this process produces a Marine qualified to fill a billet in a T/O unit. The primary manpower subprocesses involved in entry-level training include classifying Marines into particular MOS training tracks and training them in a given MOS. These subprocesses are, of course, dependent on the types of people accessed into the Marine Corps.

Planning

We discuss two aspects of entry-level training planning in this section:

- Planning for training courses that will be filled by recently accessed (or entry-level) Marines for initial MOS training
- Planning for initial classification of newly accessed Marines into MOSs.

These plans and processes are loosely connected, but they occur in different time frames and are under the cognizance of different activities. Some action officers we spoke to during this study believe that accessions planning and initial skill training need to be more closely linked and coordinated.

Training Command of Training and Education Command (TECOM) is responsible for managing MOS training. Among other responsibilities, Training Command coordinates the planning for school seats (or training quotas) to meet the Marine Corps needs. The process by which the Marine Corps arranges for school seats to meet its needs is cumbersome because there are hundreds of MOSs and training courses, conducted at dozens of schools run by all four military services. While the majority of entry-level Marines receive their initial MOS training at Marine Corps schools, the majority of initial MOS-producing courses are conducted at other service schools.

The basis for planning entry-level school seats is the ICP, with some adjustments for school attrition. This is the primary input into the development of the Training Input Plan (TIP), which enumerates the number of Marines that must be trained by course and school.[52] The TIP also includes information on course capacity and expected attrition by type of student (entry-level, regular component, reserve component, etc.) for one execution fiscal year and the four following fiscal years. It also includes the expected trimester phasing of entry-level students to be trained. This is developed by applying the Marine Corps' trimester accession phasing to the total annual entry-level student quota, taking into account that recruit training and MCT typically take at least 4 months to complete.

A TIP is developed in the first quarter of the fiscal year before the execution year. Entry-level student training requirements are based on the GAR developed the previous February.[53] It is distributed to schoolhouses for their fiscal year planning for scheduling courses and establishing their resource requirements (facilities, instructors, etc.).

Schoolhouses submit training quota memoranda (TQMs) that delineate, for each training course in the TIP that they teach, how many classes they will convene, when those classes will convene and graduate, and the capacity, by student type, for each class. TQMs are

52. It also includes the number of people from other services that must require training in Marine Corps schools.

53. The GAR includes the required inventory by grade and MOS for the current fiscal and the next five fiscal years.

finalized in the early summer prior to the beginning of the execution fiscal year. The collection of all TQMs from all the schools that provide training to Marines is also referred to as the TQM.

The TIP and TQM are maintained in the Training Requirements and Resources Management System (TRRMS). The TQM is also included in the By Name Assignment (BNA) system, which commands use to identify students assigned to specific training courses. The TIP, TQM, BNA, and other related information can be accessed via the Training Information Management System (TIMS), an Internet-based system maintained by Training Command.

These plans—the TIP and TQM—may not match entirely. For example, the school may simply be limited in facilities to accommodate enough classes to train all the Marines identified in the TIP for training. Furthermore, the GAR that the TIP and TQM were built against, may have changed somewhat by the time the execution fiscal year arrives.

Execution

Execution of entry-level training is driven primarily by (1) the TQM, (2) the Recruit Distribution Model (RDM), and, to a lesser extent, (3) the ICP.

The RDM is an optimization model that MMEA-11 runs to match recruit training graduates with school seats. The model is constrained by the programs these new Marines were guaranteed and their actual qualifications for particular MOSs. The model tries to minimize the time awaiting training, and allows the model user to adjust the priorities (for example, given higher priority to one MOS over another MOS, which are grouped in the same program and identical in required qualifications) that govern how the model matches Marines to school seats.

The model is run for each group of recruit training graduates. The Marine Corps Recruit Depots provide MMEA-11 with a list of soon-to-graduate recruits 1 to 2 weeks before graduation. MMEA-11 runs the RDM for this group, classifies them with a particular intended MOS, and assigns them to a training course. MMEA-11 tracks how well they

are meeting the ICP over the course of the year, and priorities can be adjusted in the model based on that progress.

There are several nuances to recruit classification. Some MOSs are granted after the completion of a sequence of courses, and the assignment of individuals is different from the norm.[54] Most manpower planning and execution is done on a fiscal year basis, including tracking a fiscal year's accessions as a single cohort. However, the individuals accessed in the later part of the fiscal year graduate, are classified, and receive initial MOS training in the following fiscal year. By including expected trimester student flows, the TIP allows schools to take this into account in the development of TQMs.

Information

Training Command primarily concerns itself with monitoring school operations, planning for training requirements, and monitoring the flow of students through formal training. With the establishment of TECOM and its subordinate commands—Training Command and Education Command—as well as other initiatives, TECOM is developing better means of monitoring the efficiency and effectiveness of formal training, as well as the schoolhouse leadership.

Among other things, Training Command is instituting a monthly situation report (SITREP) from all Marine schools and Marine detachments at other service schools. This SITREP is an end-of-month snapshot that includes information on the number of students in various statuses, such as under instruction, awaiting training, and awaiting transfer after completion of training.

MMEA-11 tracks classification of entry-level students. They also track year-to-date progress on meeting ICP goals for various enlistment option programs and MOSs. MP monitors the final output of the

54. For example, the Basic Electronics Course is the initial course for several MOS-training tracks or course sequences taught at the Marine Corps Communications-Electronics School (MCCES) in Twenty-Nine Palms, California. MCCES has the authority to classify graduates of the initial course into the various separate tracks.

entry-level training process—the number of MOS-qualified Marines in the first-term force.

This is not to suggest that entry-level training is entirely stovepiped. There is a Street-to-Fleet group composed of action officers from M&RA, TECOM, and MCRC that meets regularly to make this manpower process work smoothly. However, the system's design and the policy choices the Marine Corps has made create tensions or competing goals. In particular, recruit accessions are highly seasonal[55] because the Marine Corps has identified the highest quality recruits as high school diploma graduates. These recruits are usually contracted as high school seniors who want to access in the summer months follow graduation.

The formal training establishment functions more efficiently, however, if there is a steady flow of students. The result of these two conflicting pressures is that recruiting is probably less seasonal than MCRC would like. Also, formal training is probably more seasonal than TECOM and schools would like, but seasonal student flow is accommodated within the constraints of resources. In short:

- Constraining summer accessions reduces recruit quality and causes attrition to rise.
- Loading accessions into the summer contributes to time awaiting training.

Performance measures

One performance measure of the initial classification and MOS training process we have described is a comparison of TQM and classification data. *Tracking this information would provide some insight into how accessions and MOS training don't mesh, resulting in inefficiencies, such as time awaiting training.* Such insight might spur development of better, more efficient processes.

55. Accession phasing is roughly 49 percent of annual accessions occurring during June through September, 30 percent during October through January, and 21 percent during February through May.

As an example of what such performance measures might look like, we compared classification data from MMEA-11 with TQM data from TIMS for all entry-level MOSs for FY 1999 and FY 2000. The data from MMEA-11 were periodic (roughly monthly) cumulative snapshots of the number of Marines classified into particular entry-level MOSs. The data did not indicate exactly what time period they covered, and did not indicate into which course Marines were being assigned. The TQM data were more detailed; they included the number of seats allocated to entry-level Marines and the specific dates that courses and classes convened and graduated.

The classification data were not very detailed, so we made the comparison of these data by trimester. That is, we compared the number of entry-level seats for the initial course in all entry-level MOS training tracks for February through May, June through September, and October through January, with Marines classified through roughly the same time periods.

There are over 200 entry-level MOSs, we aggregated the MOSs into seven groupings of MOSs. The comparisons are presented in figures 68 through 74.

Figure 68. Entry-level MOS training: requirement vs. seats vs. assigned, combat arms

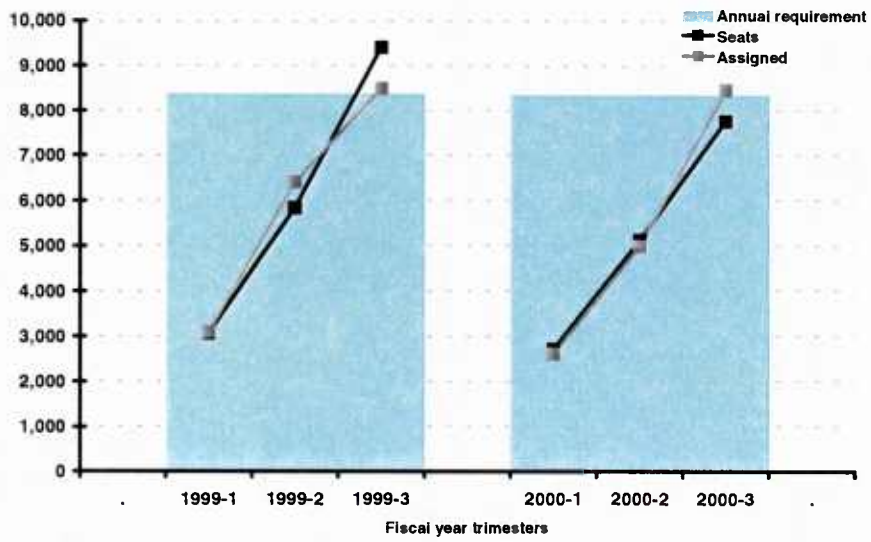


Figure 69. Entry-level MOS training: requirement vs. seats vs. assigned, combat support/combat service support

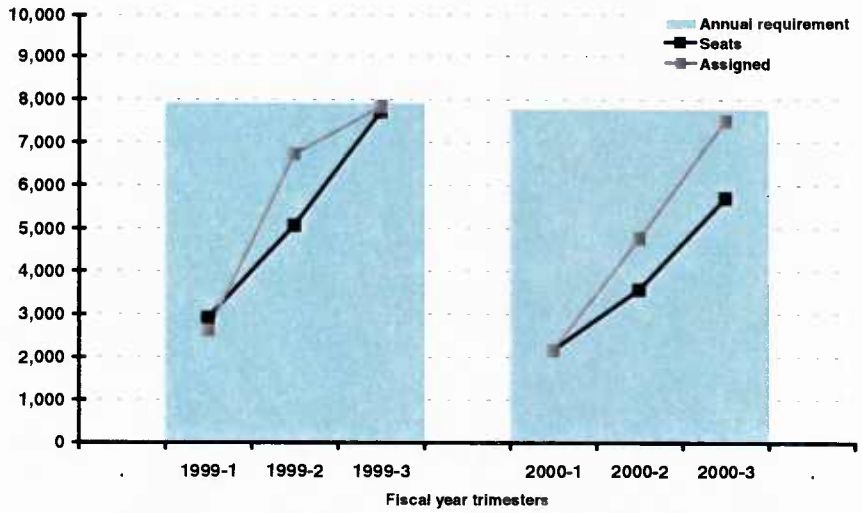


Figure 70. Entry-level MOS training: requirement vs. seats vs. assigned, intelligence

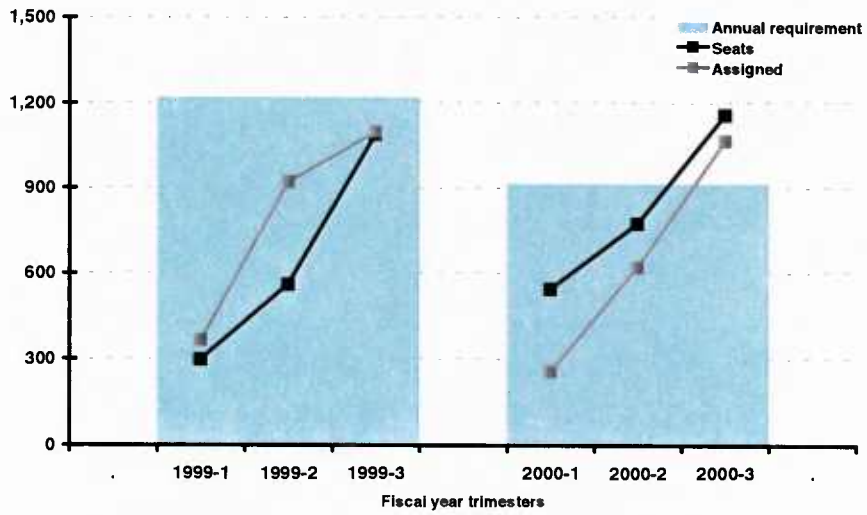


Figure 71. Entry-level MOS training: requirement vs. seats vs. assigned, ground maintenance

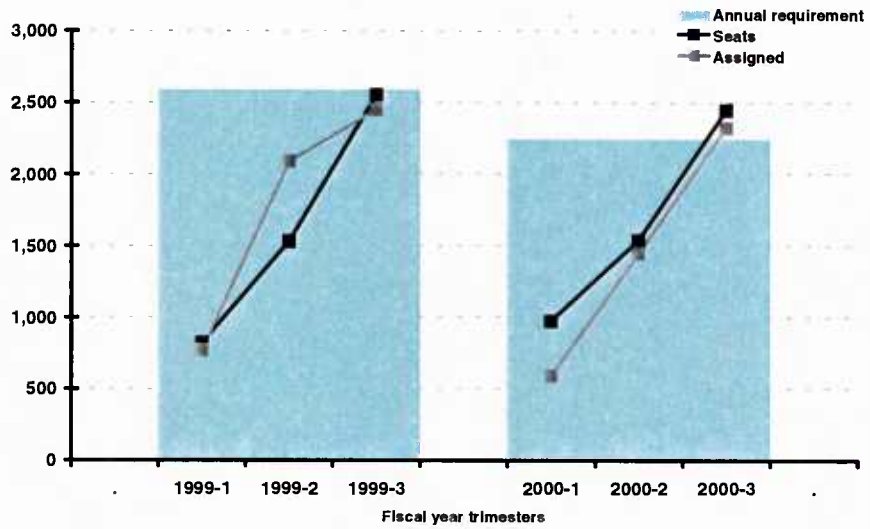


Figure 72. Entry-level MOS training: requirement vs. seats vs. assigned, other support MOSs

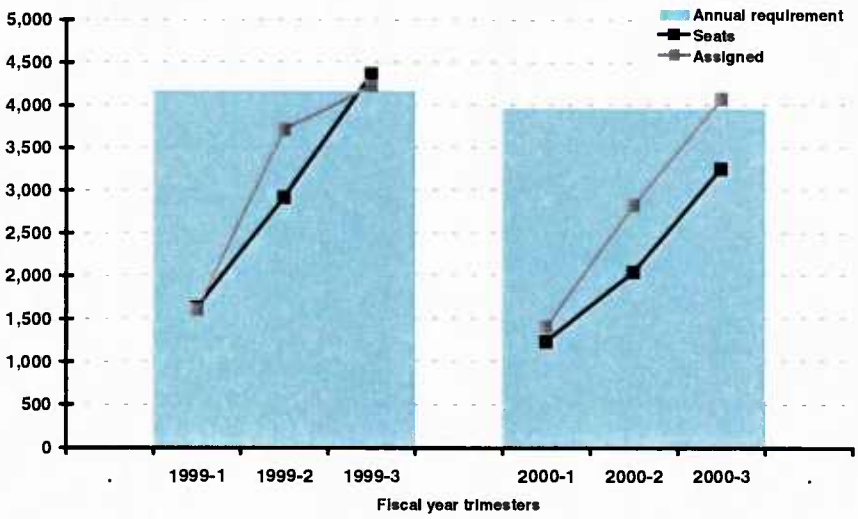


Figure 73. Entry-level MOS training: requirement vs. seats vs. assigned, aviation maintenance

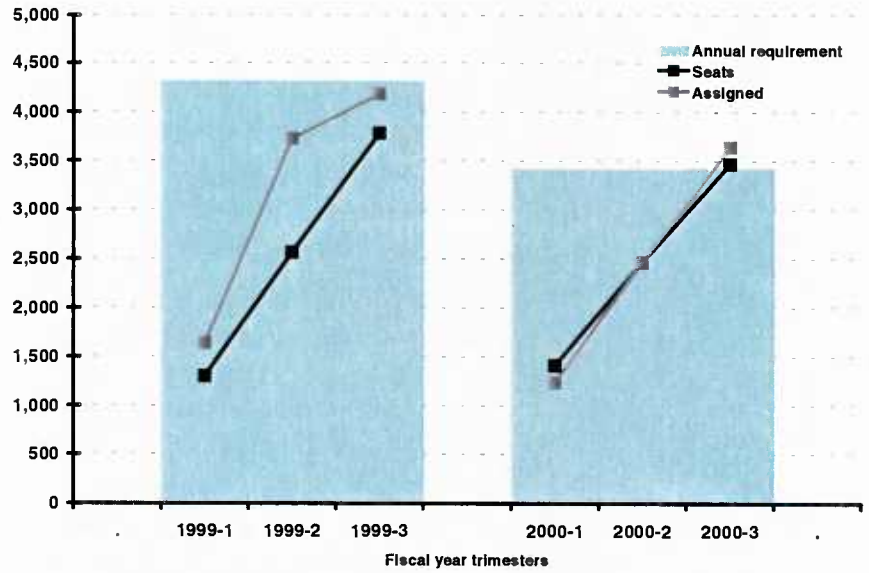
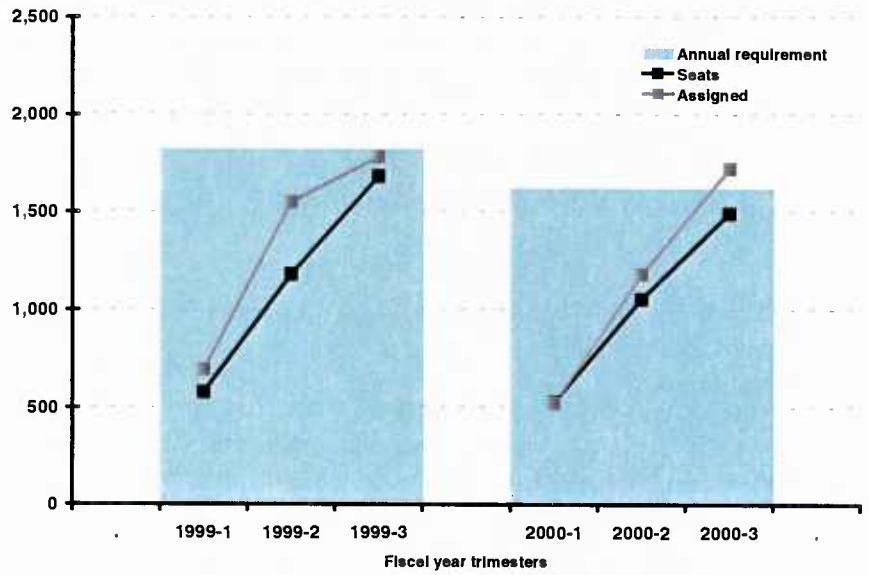


Figure 74. Entry-level MOS training: requirement vs. seats vs. assigned, other aviation support



Inventory development process: after the first term of service

Enlisted planners in MP examine the inventory and the requirements for the career force, calculating how they can change the inventory to better fit the requirements.[56] Enlisted planners cannot generally dictate separations, but they can affect reenlistments. Until this year, the career planner's only specific reenlistment objective was the first-term alignment plan (FTAP). This plan specifies "fit" and "fill." In short, reenlistment boatspaces are by MOS; this is the fit. The fill is the sum of those reenlistment boatspaces. The process that creates the FTAP uses steady-state methodology and does not attempt to make inventory match requirements by one year's reenlistments.

While the FTAP planning is done by the enlisted plans section in MP, the execution of the FTAP reenlistment plan is done by MM. Sometimes there are insufficient numbers of Marines available in an MOS to meet the FTAP requirements. In such cases, lateral moves are allowed, although usually not until the second quarter of the fiscal year. Every attempt is made to minimize lateral moves, but sometimes they are necessary. In addition, a limited number of Marines are allowed to reenlist under the quality reenlistment program (QRP) even if all the boatspaces in their PMOS are filled in the FTAP.

Starting this year, the Marine Corps also has a subsequent-term alignment plan (STAP). STAP specifies reenlistments objectives for those already in the career force. The objectives will be by MOS, but they will not be broken down by reenlistment number (second, third, fourth, etc.). Both FTAP and STAP goals are subdivided and distributed as missions to the major commands.

What tools does the Marine Corps have to achieve the FTAP and STAP goals that are stated very specifically by PMOS? We believe they have two:

- The career counselors or their commanders who try to convince Marines to reenlist
- Selective reenlistment bonuses (SRBs).

56. There are a few lateral moves in the career force; the primary method of fitting inventory to requirements is through reenlistments.

How does M&RA monitor FTAP and the STAP?

Each week MM produces a report that is circulated to various parts of M&RA that reports the FTAP goals, the reenlistments or boatspaces authorized, the boatspaces executed, and the number of reenlistment applications that are pending at MM. These measures are provided for the current year and for the previous year. The report also documents the command mission progress, open MOSs, and the lateral moves that have been approved and executed.

The selective reenlistment bonus (SRB) manager in enlisted plans also keeps a very detailed report that has information by PMOS on attainment, lateral moves, prior-service enlistment program (PSEP) Marines that are part of the FTAP, and the progress of SRB spending. The progress of SRB spending is not regularly reported throughout M&RA, but it is briefed at various points to the leadership.

Once the SRB budget is set, the SRB manager's goal is to execute the SRB budget. Spending over the budget is clearly undesirable, but underspending the budget is also problematic because unspent dollars usually mean fewer dollars for the next year's SRBs.

The second section of this document (Critical indicators for Marine Corps manpower) detailed the indicators we propose for FTAP and STAP. One of our indicators was *the percentage of regular Marines who reenlist in their PMOS as a percentage of those eligible to reenlist.* We showed data as of 29 March 2002 of PMOSs with very low reenlistment rates and significant numbers of boatspaces remaining. (At that date, the average reenlistment rate out of the EAS population was 24 percent.) We believe that such a list should be made available to the DC M&RA and the Advocates, who have a role in ensuring the health of various occupational fields. The full list is in table 5.

Table 5. Reenlistment status of selected MOSs, 29 March 2002

PMOS	PMOS name	Reenlistment rate (%)	Boatspaces remaining	Remaining EAS pop.
0251	Interrogator Debriefer	1.0	-18	104
0351	Assaultman	10.3	-45	442
2514, 0614	Unit Level Circuit Switch Operator/Maintainer	11.1	-15	32
0861	Fire Support Man	11.9	-15	59
0341	Mortarman	13.8	-60	532
0311	Rifleman	14.8	-84	2,333
1371	Combat Engineer	15.5	-17	452
0352	Antitank Assault Guided Missileman	16.7	-25	240
6323	Aircraft Communications/Navigation/Electrical Weapon Systems Technician, CH-53	19.0	-14	47
2171	Electro Optical Ordnance Repairer	19.2	-12	59
0621, 2531	Field Radio Operator	21.6	-39	709
0431	Embarkation/Logistics and Combat Service Support Specialist	24.3	-23	115
2311	Ammunition Technician	24.4	-13	158
3521	Organizational Automotive Mechanic	25.0	-17	507
2841, 2861	Ground Radio Repairer	25.1	-26	188
0844	Field Artillery Fire Control Man	29.8	-33	59
6324	Aircraft Communications/Navigation/Electrical Weapon Systems Technician, U/AH-1	29.9	-10	47
2818, 2821	Personal Computer Tactical Office Machine Repair Person	30.6	-15	50
6030, 6032, 6232	Fixed Wing Aircraft Flight Mechanic, KC-130	33.3	-17	16
2831, 2832, 283	Multi-Channel Equipment Repairman	34.1	-17	29
4341	Combat Correspondent	41.9	-14	25
6172, 6175, 6176	Helicopter Crew Chief, CH-46	46.2	-12	21

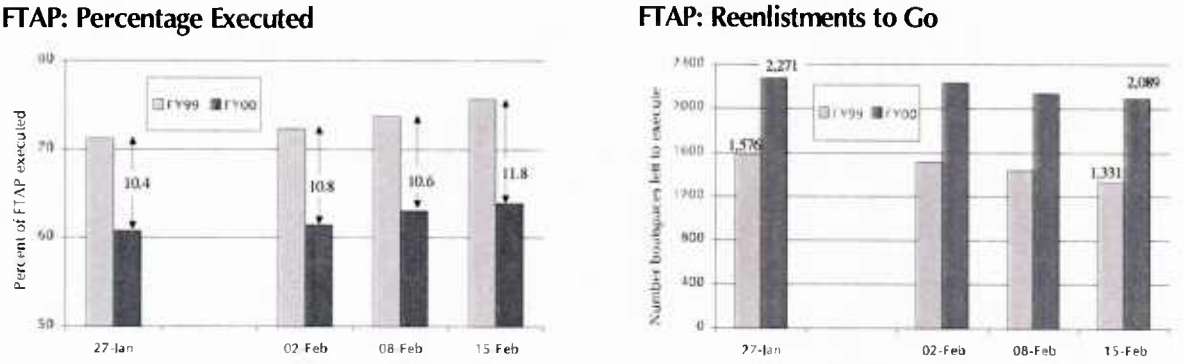
Drilling down: Additional indicators when goal is not being met

The Marine Corps was having trouble with FTAP in December of FY 2000, but this information was not widely publicized. In March 2000, the Marine Corps was still under the FTAP goal. This was a "wake-up" call for the Marine Corps and an intensive effort, including a retention stand-down, was directed by the Commandant. For 2001, however, figure 16 in the main text makes it look like the Marine Corps was right on track by March, but we're not sure that this is the case. We think the March goal should be raised somewhat, arguing that, if

the Marine Corps expects to have a tough time making FTAP, it requires a higher percentage of the reenlistments by March than it required in FY 1997-1998, when FTAP was not a challenge.

Now, let's turn to some examples of the additional information that might be provided when, as in 2000, the Marine Corps looked quite "off-track" in the FTAP effort. Figure 75 shows two figures that CNA constructed in February 2000 to illustrate progress toward the FTAP. The first graph shows the percentage of the FTAP that had been executed by 27 January, 2 February, 8 February, and 15 February for the current and previous year. The graph on the right shows the number of reenlistments that still had to be executed by the same set of dates in the current year and for the previous year.

Figure 75. FTAP in February 2000: Example of ways to show potential problems



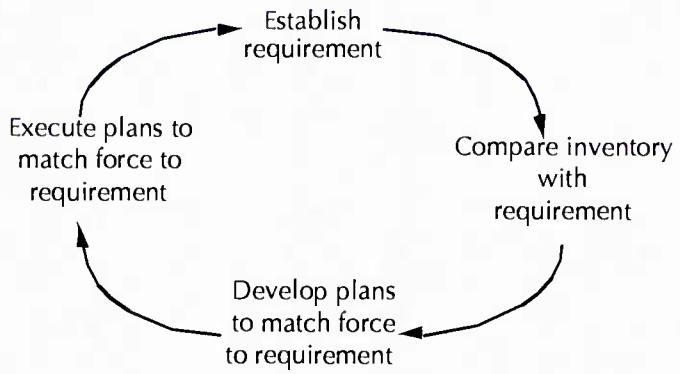
We think that it is important to show both percentages and numbers. Though numbers are more precise, it is sometimes more difficult to grasp what a number means. Also displaying the percentage reinforces the message. For example, on 15 February 2000, FTAP execution was 11.8 percent behind February 1999 levels. On 15 February 1999, we had 1,331 additional reenlistments to execute; on 15 February 2000, we had 2,089 more to execute.

Appendix C: Sample critical indicators brief

This appendix presents a sample manpower critical indicators briefing that could be produced and made available to DC M&RA if the critical indicators identified in this report (or others) were maintained.

Manpower Critical Indicators Update

How well are we doing?

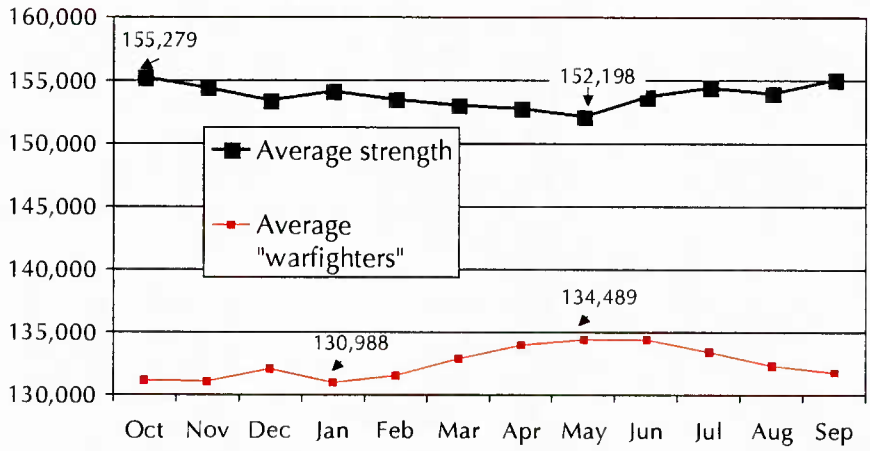


Critical indicators

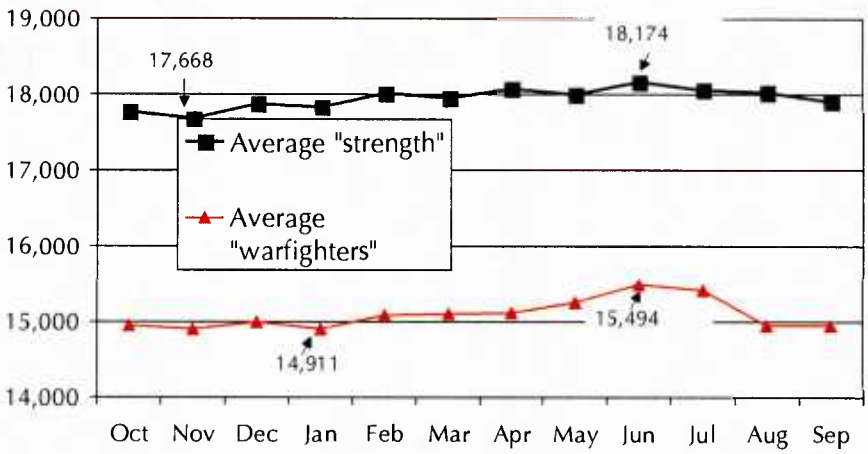
- Mega-indicators
  - Strength and warfighters (trained Marines)
  - Requirements and onboard, by MOS/grade
  - Pipeline: MOS requirements and Marines in training
  - Aviation officer inventory
  - Critical inputs: planned and actual completion dates
- Processes
  - Recruiting
  - Retention
  - Attrition
  - Initial skill training
  - Measuring short and over PMOSs

Strength & Warfighters

Enlisted strength/warfighters

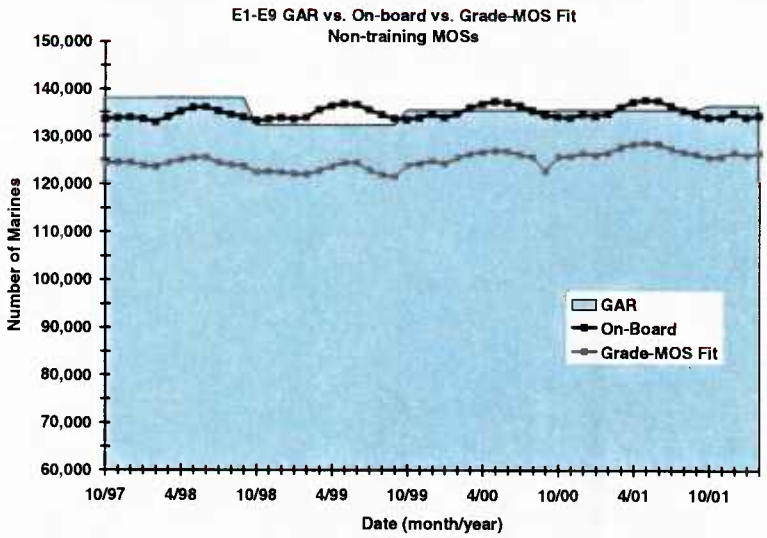


Officer strength/warfighters

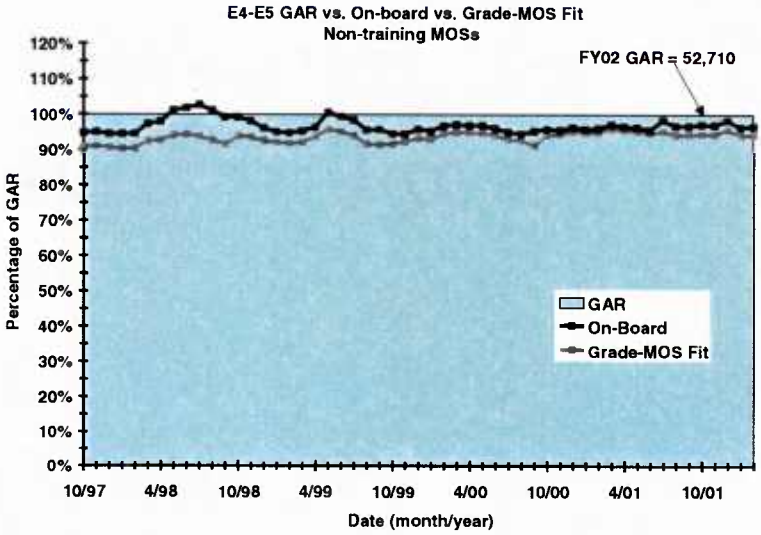


Requirements and Onboard Inventory

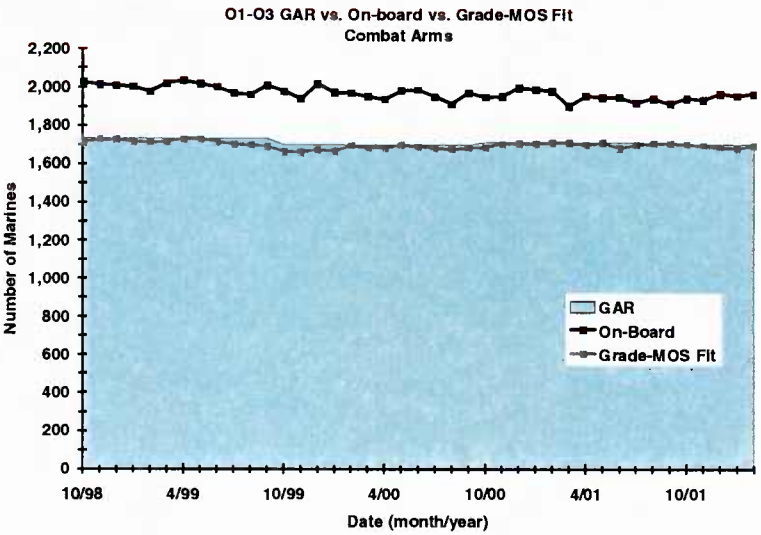
Requirements & inventory



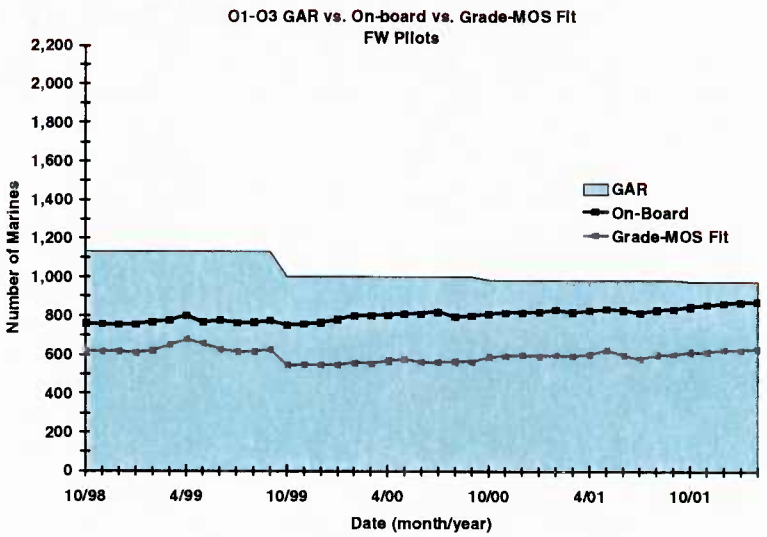
Requirements & inventory



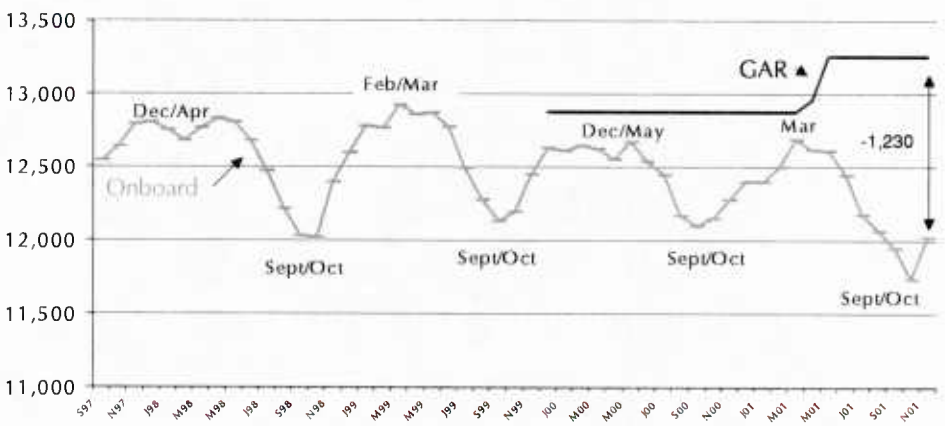
Requirements & inventory



Requirements & inventory

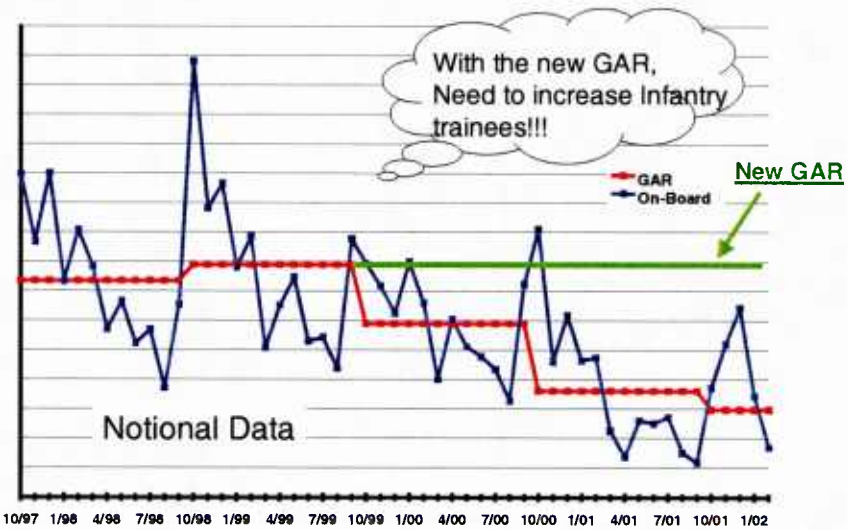


0311: onboard & requirements



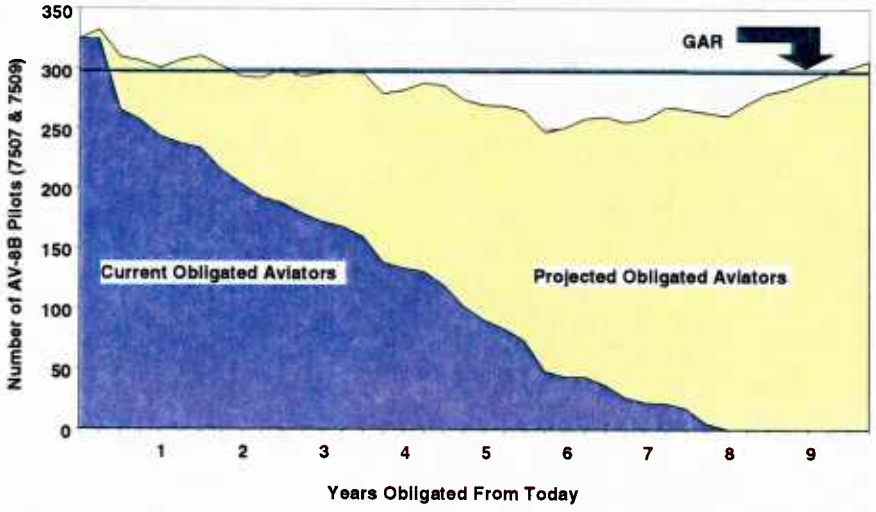
Marines in Training

Infantry Training (0300): GAR Requirement and Onboard

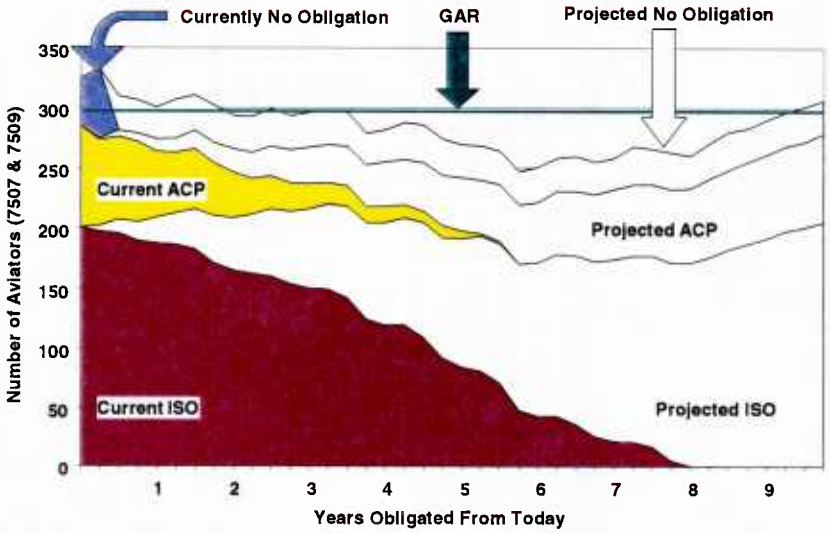


Aviation Officer Inventory

AV-8B aviator inventory



AV-8B aviator inventory



Critical Planning Inputs

Critical input plan execution

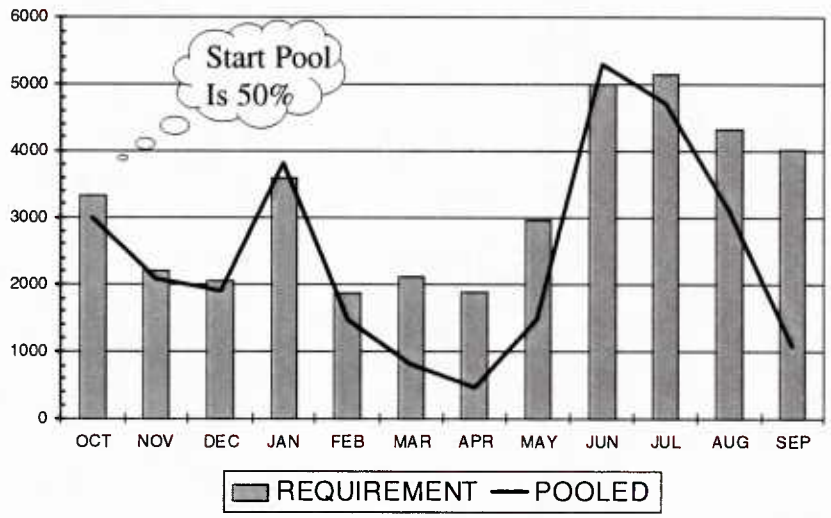
- Delays in critical input cause problems
- Planned/completion dates for:
  - Trooplist
  - ASR
  - GAR
  - Memo 01 (Accession Plan)
  - Budgetary submissions

Critical indicators for processes

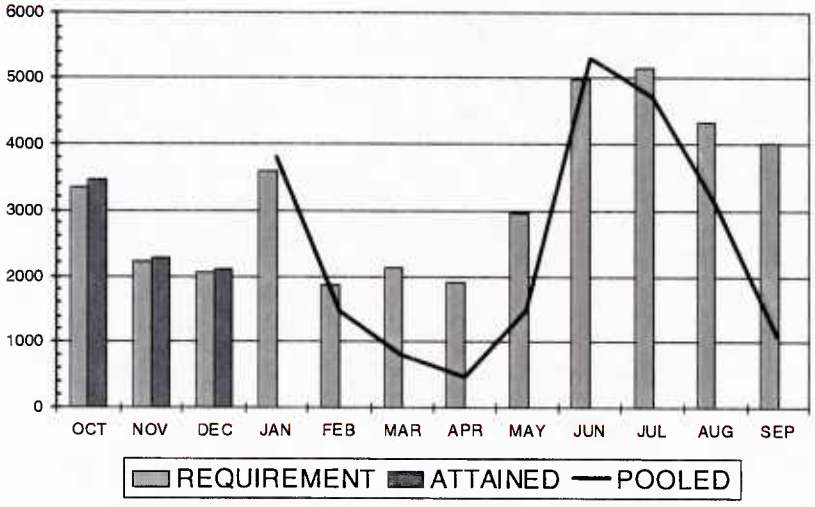
- Recruiting
- Retention
- Attrition
- Initial skill training
- Measuring short and over PMOSs

Recruiting

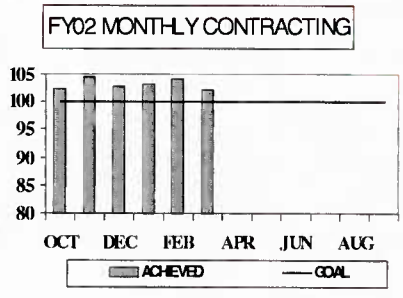
Pool & accession requirement



Shipping



Contracting & shipping



	FYTD
CONTRACTING FY02	103.2%
CONTRACTING FY01	1032.1%
CONTRACTING FY00	101.9%

	FYTD
SHIPPING FY02	101.9%
SHIPPING FY01	102.4%
SHIPPING FY00	100.5%

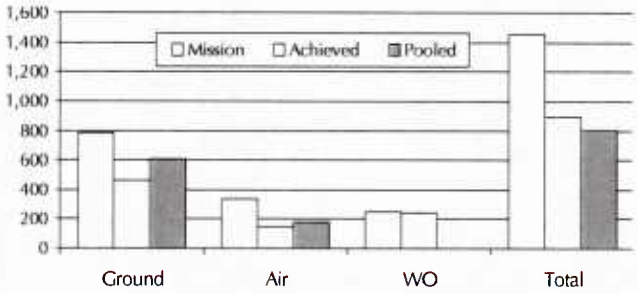
TIER I HIGH SCHOOL GRADS (DoD GOAL 90%; USMC GOAL 95%)

FYTD	FY02	FY01	FY00
SHIPPED	97.1%	94.8%	93.7%
CONTRACTED	97.8%	96.4%	96.3%

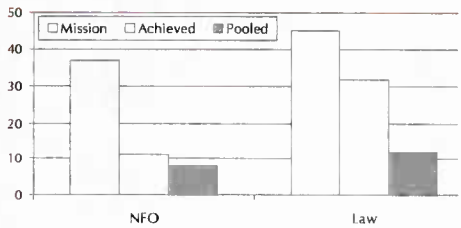
MENTAL GROUP I-IIIA (DoD GOAL 60%; USMC GOAL 63%)

FYTD	FY02	FY01	FY00
SHIPPED	68.2%	64.3%	63.6%
CONTRACTED	70.4%	66.5%	66.5%

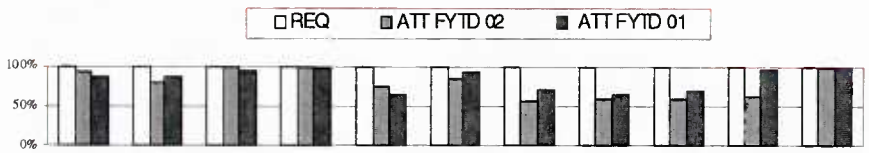
Officer recruiting



Candidates selected for 180th OCC will make up differences in Air, NFO, and Law missions.



Program execution

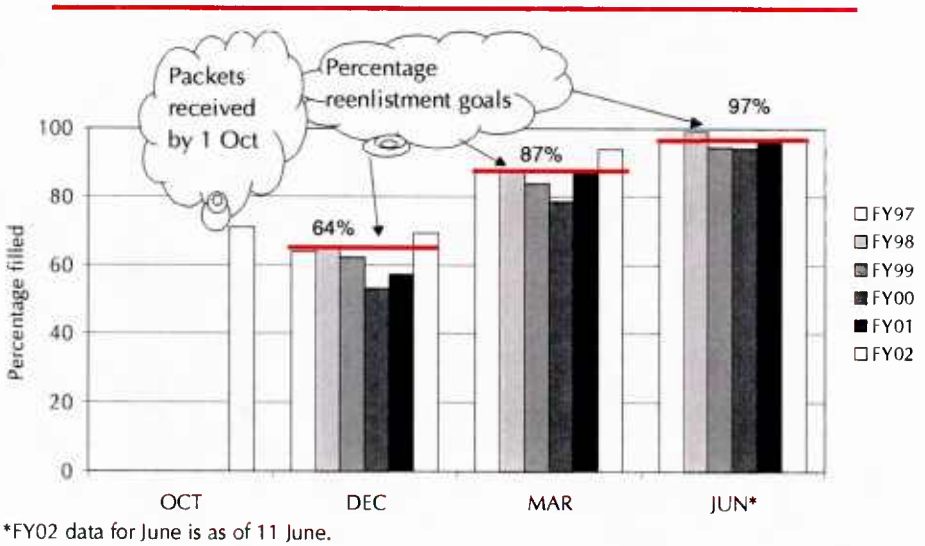


	TOTAL	AE	AF	AG	AJ/E1	BA/E7	BY/BZ	CJ	CK/E4	DC/E6	DD
REQ	8063	964	1829	395	447	1484	905	1106	331	164	438
ATT FY02	78%	80%	CLOSED	CLOSED	74%	88%	57%	58%	59%	62%	CLOSED
ATT FY01	88%	86%	93%	98%	66%	93%	72%	65%	70%	96%	CLOSED

AE – AVIATION SUPPORT
AF – AIRCRAFT MECH
AG – AIR CREW
AJ/E1 – AVIATION OPS
BA/E7 – AVIATION ELEC
BY/BZ – GROUND ELEC
CJ – LOGISTICS
CK/E4 – FIRE DIREC/CONT
DC/E6 – CRYPTO LING
DD – INTELLIGENCE

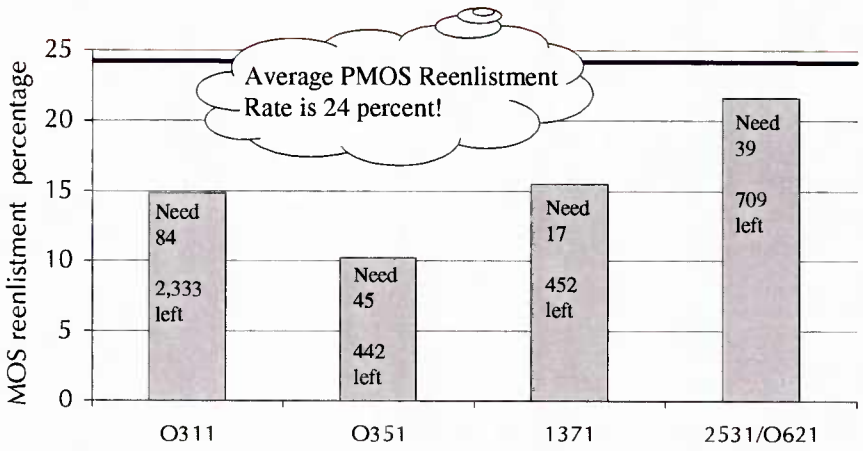
Retention

Tracking FTAP

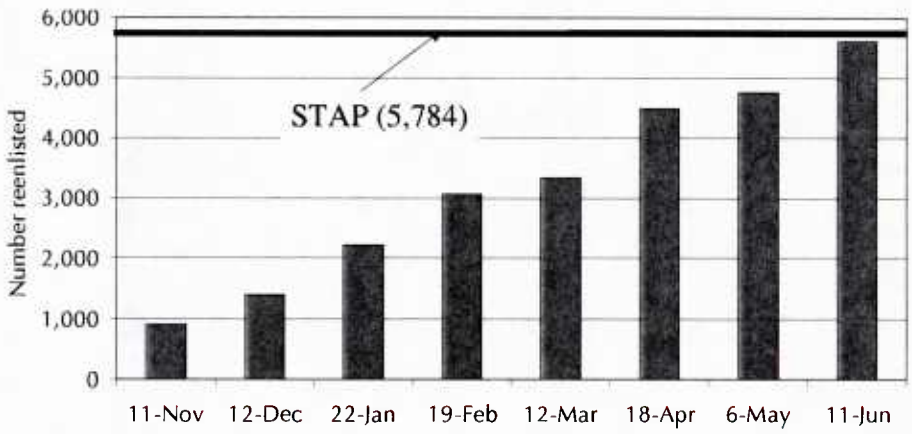


*FY02 data for June is as of 11 June.

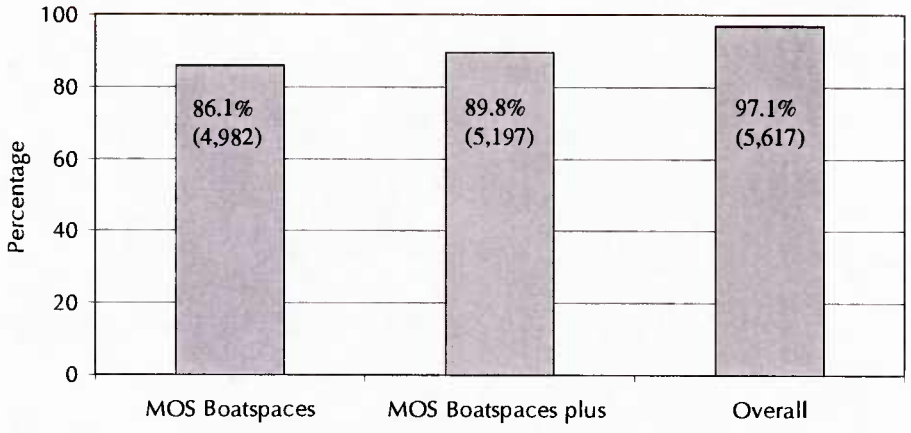
EASers reenlistment rates



Tracking STAP

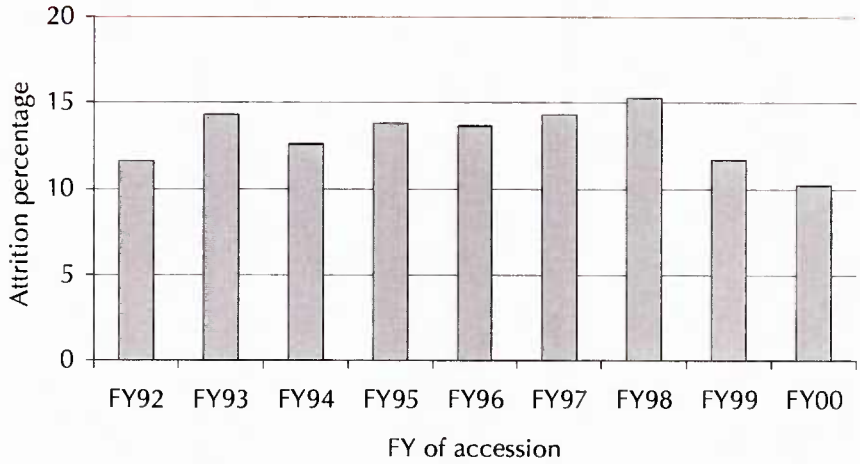


FTAP: June 2002



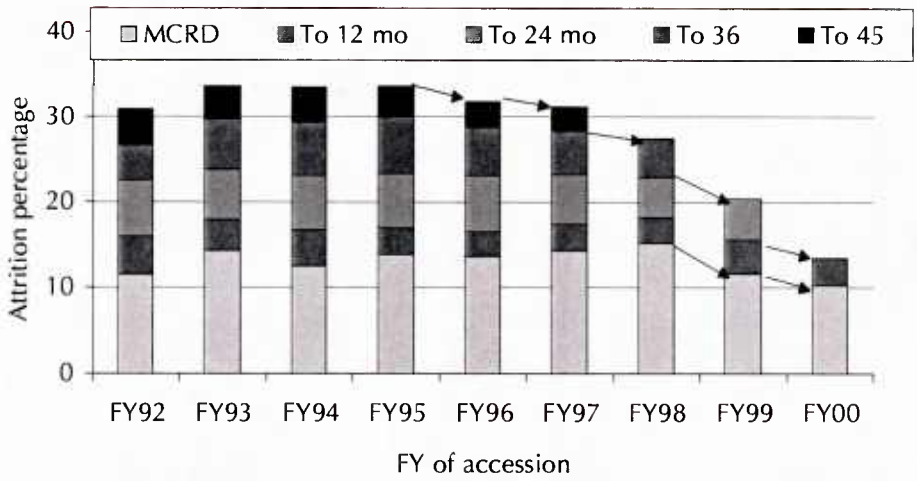
Attrition

MCRD attrition: regulars



Source: CNA Street-to-Fleet database.

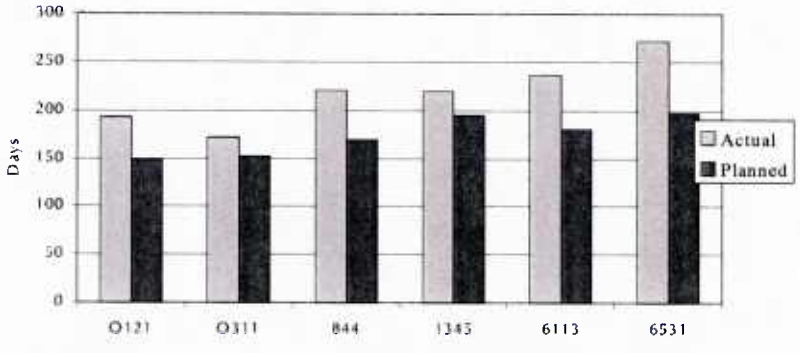
1st term attrition: regulars



Source: CNA Street-to-Fleet database.

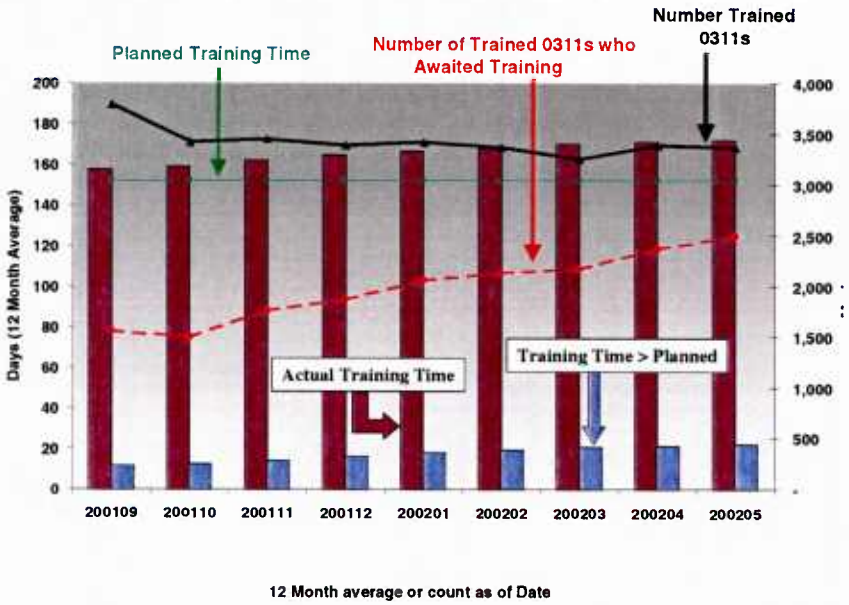
Initial Skill Training

Time to train: planned vs. actual



Actual time in training is the average for the Jun 01 – Mary 02 period.

Time-to-train database: 0311s



Time to train:
Infantry Officer (0302)

Planned training time is 234 days (see green horizontal line).

Short and Over MOSs

Short MOSs: Less than 90% *or* 100 short

- Provide list
- Exploit seasonality to better understand overages
  - Short MOS in spring when warfighters strength is highest
  - If steps aren't taken, MOS will be more short the following fall

Over MOSs: Greater than 110% *or* at least 100 over

- Provide list
- Exploit seasonality to better understand overages
  - Over MOS in fall when warfighters warfighters strength is lowest
  - If steps aren't taken, MOS will be more overmanned the following spring

List of figures

List of tables